Draft
Finding of No Significant Impact (FONSI)

Name of Proposed Action

Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1) at McChord Air Force Base, Washington

Description of Proposed Action and Alternatives

Alternatives analyzed include the Proposed Action, two alternatives, and the No Action Alternative. Reasonable alternatives should meet the criteria for safe operation of aircraft set forth in Unified Facilities Criteria (UFC) 3-535-01 and UFC 3-260-01, which require that airspace imaginary surfaces be maintained free of obstructions for the safe operation of aircraft, and be environmentally sound. A light detection and ranging (LIDAR) survey conducted at McChord AFB in 2002 indicated that trees and vegetation obstruct the airspace imaginary surfaces and violate the UFC. An Environmental Assessment (EA) was prepared for removal of trees and other vegetation violating the UFC requirements in the Runway 16/34 south approach-departure imaginary surface (50:1) north of Perimeter Road. The EA does not address violations of airspace imaginary surfaces in other areas (south approach-departure zone south of Perimeter Road; East and West transitional surfaces; Inner Horizontal Surfaces; or off-base violations). Current plans call for airfield waivers to be requested in these areas. Separate documentation pursuant to the National Environmental Policy Act would be prepared if tree removal activities are eventually required within these other areas.

The Proposed Action would involve clear cutting selected areas of the project area where current or potential future violations of the 50:1 imaginary surface have been identified, and topping trees within the Draper wetland. Currently, trees in the Draper wetland are topped to ensure they do not penetrate the 50:1 imaginary surface. Under the Proposed Action, these trees would continue to be topped rather than clear cut. Although all trees outside the Draper wetland with the potential to penetrate the 50:1 imaginary surface would be removed, seedlings would re-emerge in the area because other trees remain nearby. Long-term maintenance would include additional tree removal in future years to remove trees that would regenerate from seed or root structures. Frequent topping of trees in the Draper wetland would continue to be required.

Under Alternative 1, all trees inside the South Approach to Runway 16/34, north of Perimeter Road, would be clear cut. Tree removal would be conducted using chain saws and a self-loading truck. Tree trunks and large branches would be removed from the site, and slash would be left in place. Areas where clear cutting has occurred would be maintained as grassland, and replanting of trees in these areas would not be permitted. Although all existing trees would be removed, seedlings would re-emerge in the area because other trees remain nearby. Long-term maintenance would be similar to that described for the Proposed Action.

Alternative 2 would involve selective removal of individual trees with current or potential future violations of the 50:1 imaginary surface, and topping trees within the Draper wetland as under the Proposed Action. Although all trees outside the Draper wetland with the potential to penetrate the 50:1 imaginary surface would be removed, seedlings would re-emerge in the area because other trees remain nearby. Long-term maintenance would be similar to that described for the Proposed Action.

The Proposed Action and both alternatives would meet the objectives defined above.

The No Action Alternative would not meet the objective defined above and is not considered a viable option.

The preferred alternative is the Proposed Action because this alternative best meets the selection criteria identified in Section 2.1 by satisfying UFC requirements and minimizing environmental impacts, e.g., not cutting trees in the Draper wetland.

Summary of Environmental Consequences

Potential impacts on the human and natural environment were evaluated relative to the existing environment. For each environmental resource or issue, anticipated direct and indirect effects were assessed, considering both short-term and long-term project effects. Although implementation of the Preferred Alternative, i.e., the Proposed Action, would affect the human and natural environment, impacts would be less than significant. The Preferred Alternative would have:

- Minor, short-term adverse impacts on air quality as a result of tree felling activities.
- Minor, short-term adverse impacts due to noise during tree felling activities.
- Potential for minor, short-term adverse impacts due to use of fuels during logging operations. Such impacts would be minimized through the use of best management practices.
- Minor, short-term adverse impacts on soil during tree felling activities.
- Minor adverse impacts to groundwater resources due to minimal localized soil compaction from logging equipment.
- Both adverse and beneficial impacts on biological resources from the elimination of some habitats, potentially leading to an increase in invasive species, and potential enhancement of open grassland and felling of invasive Douglas-fir trees. No federally protected species are believed to be present within the proposed action area. Potential adverse effects on migratory birds may be avoided by planning the action for fall, when birds are not nesting. Tree management of the Draper wetland would continue as under current practices.
- Beneficial impacts on airspace/airfield operations due to safe operation and maintenance of Category (CAT) II Instrument Landing System (ILS) capability.
- Beneficial impacts on safety and occupational health for pilots, crews, and passengers.

Overall, the analysis for this EA indicates that implementation of the Proposed Action for tree removal would not result in significant impacts.

Public Review and Interagency Coordination

The project would be implemented upon approval and after a public review period. All interested agencies, groups, and persons are invited to submit written comments by November 13, 2007, to the McChord AFB Public Affairs Office. A copy of the Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1) EA is posted online at: *http://public.mcchord.amc.af.mil*; and is available at McChord AFB Library (Base Library), Pierce County Library Lakewood Branch, Pierce County Library Parkland/Spanaway Branch, and Tillicum Branch Library, until November 13, 2007.
For questions regarding the EA, contact:

62 AW/PA
100 Col Joe Jackson Blvd, Suite 1077
McChord AFB, WA 98438-1109

Finding of No Significant Impact

In accordance with the National Environmental Policy Act (NEPA) of 1969; Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA, 40 Code of Federal Regulations (CFR) 1500-1508; and the Environmental Impact Analysis Process, 32 CFR 989, the Air Force concludes that implementation of the Proposed Action would have no significant impact on the quality of the environment and that the preparation of an Environmental Impact Statement is not warranted.

SIGNED:

_____ **DATE:**_____

JERRY P. MARTINEZ, Colonel, USAF
Commander, 62d Airlift Wing

Attachment: Environmental Assessment

Draft

Environmental Assessment

Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1)

McChord Air Force Base, Washington

Contract No. F41624-03-D-8595

Delivery Order No. 0352

Submitted to

Air Mobility Command
McChord Air Force Base, Washington 98438

October 2007

Executive Summary

McChord Air Force Base (AFB) proposes to remove trees within the Runway 16/34 Approach-Departure South Approach, north of Perimeter Road. Trees in this area currently penetrate or have the potential to penetrate the established 50:1 approach-departure airspace imaginary surface.

This Environmental Assessment (EA) analyzes the potential physical, biological, cultural, and socioeconomic impacts associated with the Proposed Action, two alternatives, and the No Action Alternative (maintaining existing conditions). This EA does not address violations of airspace imaginary surfaces in other areas (south approach zone south of Perimeter Road; east and west transitional surfaces; Inner Horizontal Surfaces; or off-base violations). Current plans call for airfield waivers to be requested in these areas. Separate National Environmental Policy Act (NEPA) documentation would be prepared if tree removal activities are eventually required within these other areas.

The Proposed Action involves clear cutting selected areas within the proposed action area with vegetation that is currently penetrating, or having the potential to penetrate, the 50:1 approach-departure airspace imaginary surface. Selective cutting would be conducted using a combination of survey data and unaided visual observation in the field. Trees within the Draper wetland would require ongoing maintenance by selective topping as the trees continue to grow. With support from the Air Mobility Command at Scott AFB and the Air Force Center for Engineering and the Environment at Brooks AFB, McChord AFB has prepared an EA for the Proposed Action in accordance with the NEPA implementing regulations, Title 32 Code of Federal Regulations, Part 989, and Department of Defense directives.

The objective of the Proposed Action is to remove all trees and vegetation currently penetrating, or having the potential to penetrate, the 50:1 approach-departure airspace imaginary surface. Other restrictions applicable to the proposed action area include the Clear Zone (including Graded Area), and the Zone of Frangibility.

The Proposed Action would meet the objective defined above. Alternatives 1 and 2 would also meet the objective defined for the Proposed Action. Under Alternative 1, all trees within the boundaries of the South Approach Zone, north of Perimeter Road, including those in the Draper wetland, would be clear cut. Under Alternative 2, individual trees would be identified by type throughout the area, and would only be removed if their potential maximum growth exceeds the 50:1 imaginary surface at the location where they are found.

The No Action Alternative would not meet the objective defined for the Proposed Action and is not considered a feasible option.

Potential impacts on the human and natural environment were evaluated relative to the existing environment. For each environmental resource or issue, anticipated direct and indirect impacts were assessed considering both short- and long-term project effects. Although implementation of the Proposed Action would affect the human and natural environment, only minor impacts would be expected with the selective felling of trees.

Consistent with current management practices, trees in the Draper wetland would continue to be topped, rather than clear cut, thus presenting no change (i.e., no impact) from current conditions. The Proposed Action could result in the following consequences at McChord AFB:

- Minor, short-term adverse impacts on air quality as a result of tree felling activities.
- Minor, short-term adverse impacts due to noise during tree felling activities.
- Potential for minor, short-term adverse impacts due to use of fuels during logging operations. Such impacts would be minimized through the use of best management practices.
- Minor, short-term adverse impacts on soil during tree felling activities.
- Minor adverse impacts to groundwater resources due to minimal localized soil compaction from logging equipment.
- Both adverse and beneficial impacts on biological resources due to elimination of some habitats, potentially leading to an increase in invasive species, and potential enhancement of open grassland and felling of invasive Douglas-fir trees. No federally protected species have been found to be present within the proposed action area. Potential adverse impacts on migratory birds would be avoided by planning the action when birds are not nesting.
- Beneficial impacts on airspace/airfield operations due to the ability to safely operate and maintain Category (CAT) II Instrument Landing System (ILS) capability.
- Beneficial impacts on safety and occupational health for pilots, crews, and passengers.
- No impact to the Draper wetland would result because trees would continue to be topped, consistent with current management practice.

No impacts are anticipated to occur on socioeconomics, cultural resources, land use, utility infrastructure, transportation, environmental management, environmental justice, or the protection of children.

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Figures (provided in a group at the end of this document)

Acronyms and Abbreviations

Air Force	U.S. Air Force
AFB	Air Force Base
AFCEE	Air Force Center for Engineering and the Environment
AFH	Air Force Handbook
AICUZ	Air Installation Compatible Use Zone
ALGT	American Lakes Garden Tract
AMC	Air Mobility Command
APZ	Accident Potential Zone
ATSEP	Air Traffic System Evaluation Program
BASH	Bird/Wildlife Aircraft Strike Hazard
BMP	best management practice
CAA	Clean Air Act
CAT I	Category I
CAT II	Category II
CEQ	Council on Environmental Quality
CES/CEV	Civil Engineering Squadron Environmental Flight
CEV	Environmental Management Flight
CFR	Code of Federal Regulations
CO	carbon monoxide
CRMP	Cultural Resources Management Plan
CT	census tract
CWA	Clean Water Act
dBA	decibels on the A-weighted scale
dbh	diameter at breast height
DNL	day-night average sound level
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office

EA	environmental assessment
EDNA	environmental designation for noise abatement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHA	Federal Highway Administration
FIS	Fighter Interceptor Squadron
FIFCFS	Federal Interagency Forum on Child and Family Statistics
HQ	Headquarters
INRMP	*Integrated Natural Resources Management Plan*
ILS	Instrument Landing System
IRP	Installation Restoration Program
L_{eq}	equivalent noise level
LIDAR	light detection and ranging
L_n	percentile noise level
NAAQS	National Ambient Air Quality Standards
MAPS	Monitoring Avian Productivity and Survivorship
MBTA	Migratory Bird Treaty Act
MSA	Metropolitan Statistical Area
NC	data point not collected at the site
NEPA	National Environmental Policy Act
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
O_3	ozone
PM_{10}	particulate matter less than or equal to 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in aerodynamic diameter

RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
SCS	Soil Conservation Service
TNC	The Nature Conservancy
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources

SECTION 1.0

Purpose of and Need for the Proposed Action

1.1 Introduction

To provide for the safe navigation of aircraft at McChord Air Force Base (AFB), Washington, McChord AFB proposes to implement a tree and vegetation management plan, as required by the U.S. Air Force (Air Force) Air Mobility Command (AMC) policy. Implementation of the plan will eliminate airfield obstructions located in the Runway 16/34 south approach-departure surface north of Perimeter Road that have been determined to be in violation of the airspace 50:1 imaginary surface. Figure 1-1 shows the location of McChord AFB (Base). (Note: All figures are located at the end of this report.)

McChord AFB, with the support of AMC and the Air Force Center for Engineering and the Environment (AFCEE), has prepared an environmental assessment (EA) in accordance with regulations implementing the National Environmental Policy Act (NEPA) implementing regulations (Title 40 Code of Federal Regulations [CFR], Part 1500 through 1508), Air Force Regulations (32 CFR 989), and Department of Defense directives. The purpose of this EA is to evaluate the potential environmental impacts of implementing the Proposed Action, the No Action Alternative, and other reasonable alternatives.

1.2 Purpose of the Proposed Action

Air Force policy, which adopts Unified Facilities Criteria (UFC) 3-260-1, Airfield and Heliport Planning and Design, and UFC 3-535-01, Visual Air Navigation Facilities, (see Section 1.4), requires that airspace imaginary surfaces be maintained free of obstructions for the safe operation of aircraft. A light detection and ranging (LIDAR) survey conducted at McChord AFB in 2002 indicates that trees and other vegetation obstruct the airspace imaginary surfaces and violate the UFC. The results of the LIDAR survey were verified by 62 Civil Engineering Squadron (CES/CECP) and finalized in April 2003. The purpose of the Proposed Action is to comply with the Air Force policy for tree and vegetation management below the 50:1 airspace imaginary surface for the Runway 16/34 south approach-departure surface north of Perimeter Road at McChord AFB and maintain a safe airspace for operating aircraft in compliance with the UFC. Air Force Form 813 is shown in Appendix A. This document describes the Proposed Action and alternatives to achieve compliance with Air Force policy (UFC 3-260-1 and UFC 3-535-01) on the management of tree and vegetative obstructions violating the Runway 16/34 south approach-departure surface (50:1) north of Perimeter Road at McChord AFB. Figure 1-2 shows the area to be included in the Proposed Action. Figure 1-3 presents a typical cross section of an approach-departure airspace imaginary surface.

McChord AFB plans to achieve compliance with both UFCs by taking the following actions:

- Phase 1A– Removes violations of the Runway 16/34 south approach surface north of Perimeter Road, supporting continued use for Category II (CAT II) Instrument Landing System (ILS).
- Phase 1B – Removes on-base violations of the Runway 16/34 north approach imaginary surface, supporting continued use for Category I (CAT I) ILS. Removes on-base violations of the Runway 16/34 south approach surface south of Perimeter Road, supporting continued use for CAT II ILS. An airfield waiver will be requested for this requirement.
- Phase 2 – Removes on-base violations within the East and West Transitional Surfaces (7:1). An airfield waiver will be requested for this requirement.
- Phase 3 – Removes on-base violations within the East Inner Horizontal Surface. An airfield waiver will be requested for this requirement.
- Phase 4 – Requires real estate actions and removes off-base violations. An airfield waiver will be requested for this requirement, with the exception of the North clear zone where McChord AFB holds easements that will be enforced to remove tree violations. Any environmental effects associated with these real estate actions in the North clear zone will be evaluated separately as necessary.

Figure 1-4 shows a complete depiction of airspace and control surfaces reprinted from Air Force Handbook (AFH) 32-7084, Air Installation Compatible Use Zone (AICUZ) Program Manager's Guide (1 Mar 1999).

The airfield obstruction removal described in Phase 1A is the highest priority for McChord AFB because the most recent Air Traffic System Evaluation Program (ATSEP) Report (17 – 21 July 2006) included a recommendation to "remove offending trees to bring airfield into compliance with UFC 3-260-1 criteria." The report recommends prioritization of tree trimming and removal projects, specifically stating, "[i]f 50 to 1 tree violations are not trimmed or removed, instrument approach and departure minimum will be increased, effectively eliminating CAT II ILS capability in the near future."

This EA addresses Phase 1A. This EA does not include the remainder of Phase 1, or Phases 2, 3, or 4. Each class of violations not addressed by in this EA will be the subject of an airfield waiver request. The waiver process involves preparation of a package for Headquarters (HQ) AMC, including an analysis of operational risks in maintaining the current status and justification for granting the waiver. After review of the waiver package, HQ AMC can grant an airfield waiver or require McChord AFB to implement corrective action immediately. Other classes of violations (i.e., Phases 1B, 2, 3, and 4) are not interdependent with the Proposed Action, and execution will not occur simultaneously.

1.3 Need for the Proposed Action

McChord AFB is home to the 62d Air Wing of the AMC, which is composed of C-17 aircraft. Transient aircraft using McChord AFB are primarily AMC mission aircraft, including C-5, C-130, KC-135, KC-10 aircraft and their variants. The Proposed Action is needed because

trees penetrate the established airspace imaginary surfaces required for safe operation of aircraft according to UFC 3-260-1 and UFC 3-535-01. The action is proposed only for tree and vegetation management in the south approach-departure surface north of Perimeter Road (Figure 1-2). Safe operation of aircraft includes use of an ILS. A CAT II ILS provides the lateral and vertical guidance necessary to fly a precision approach. This system is a critical component of mission operations at McChord AFB. Failure to clear trees that violate the imaginary surface could result in the need to shut down McChord AFB CAT II ILS and significantly impair mission operations.

1.4 Objectives of the Proposed Action

The objective of the Proposed Action is to remove objects, specifically trees and other vegetation that penetrate the established 50:1 approach-departure airspace imaginary surface. Maintaining an approach-departure surface clear of all obstacles provides for safe aircraft operations, and promotes public safety both on and off base. Air Force accident data (1968-1995) demonstrates that of 838 accidents that occurred during the period, the highest percentage (27.4) of accidents (230) occurred in the clear zone, which includes the area affected by the Proposed Action. Figure 1-5 shows the cited accident data reprinted from AFH 32-7084, AICUZ Program Manager's Guide (1 Mar 1999).

UFC 3-260-1 does not allow trees to violate the 50:1 airspace imaginary surfaces. Tree height must not exceed 10 feet below the elevation of this surface. The characteristics of this surface are:

- Dimensions: 2,000 feet wide at the beginning, which is 200 feet from the end of the runway, and extending 25,000 feet to a width of 9,000 feet.
- Slope: 50 feet horizontal for every 1 foot vertical.
- Elevation: Start elevation is the same as the end-of-runway elevation. The end elevation is 500 feet above airfield elevation.

UFC 3-260-1 also places restrictions on objects, including trees, located in the Clear Zone (including Graded Area) and in the Zone of Frangibility. The Clear Zone is an area measuring 3,000 feet long by 3,000 feet wide and is centered on the extended runway centerline. The Clear Zone (Graded Area) is prepared and maintained as an aircraft safety area, and measures 2,000 feet wide by 1,000 feet long, centered on the extended runway centerline. No above ground objects, including trees, can be located within the Clear Zone (Graded Area). Outside the Graded Area, land use within the Clear Zone is restricted to certain uses as identified within Air Force Instruction 32-7063 AICUZ, and objects within this area must comply with height restrictions for the airspace imaginary surface (described above) and Zone of Frangibility. The Zone of Frangibility is an area 500 feet wide by 3,000 feet long, centered on the extended runway centerline. All items sited within the Zone of Frangibility must be frangible (i.e., easily broken).

Other criteria governing obstructions in the approach-departure surface include UFC 3-535-01, which prescribes approach light plane criteria. The UFC states no objects may penetrate the light plane except components of the ILS and airfield lighting systems which

are fixed by their function. Figure 1-6 provides a view of Light Plane Elevation Limits. The surface is defined by the following parameters:

- Ideally, the light plane is a single horizontal plane through the runway threshold.
- If the 1,000 feet of the runway at the threshold end is sloped, the first 300 feet of the paved or stabilized area of the approach-departure surface and the light plane for this area must continue with the same slope.
- The final 700 feet of the paved or stabilized area may have a slope of not more than 1.5 percent up or down.
- From the 1,000 foot crossbar to the beginning of the approach light system, the preferred light plane is horizontal and includes the 1,000-foot crossbar lights.
- If the clearance of obstructions or terrain prohibits using a horizontal light plane, this plane may be sloped. The slope of this plane must not exceed 2 percent up or 1.5 percent down.
- The preferred light plane in the area beyond the 1,000-foot crossbar is a single plane, but changes in the slope of the plane are permitted.
- All light planes start and end at a light station and contain not less than three light stations.

The first 1000 feet of the light plane from the end of the runway is covered by the Clear Zone (Graded Area).

1.5 Location of the Proposed Action

McChord AFB is located in Pierce County, Washington, at approximately 122°29′ west and 47°08′ north. McChord AFB is bounded to the north by the cities of Lakewood and Tacoma, to the west by the City of Lakewood, to the south by Fort Lewis Military Reservation, and to the east by unincorporated areas of Pierce County. Figure 1-1 shows the relationship of McChord AFB and the associated Air Force airspace imaginary surface to the local jurisdictions.

1.6 Scope of the Environmental Assessment

This EA documents and analyzes the potential environmental and socioeconomic effects associated with the Proposed Action, the No Action Alternative, and two additional reasonable alternatives. The EA evaluates the potential environmental effects that are reasonably foreseeable at this time.

1.7 Applicable Regulatory Requirements and Required Coordination

The EA was conducted in accordance with the President's Council on Environmental Quality (CEQ) regulations, 40 CFR 1500 through 1508, as they implement the requirements

of NEPA, 42 U.S. Code Section 4321 et seq., and 32 CFR 989, The Environmental Impact Analysis Process.

Air Force Regulation 32 CFR 989 specifies the procedural requirements for the implementation of NEPA and directs the Air Force to consider environmental consequences as part of the planning and decision-making process.

Other environmental regulatory requirements relevant to the Proposed Action and alternatives are also identified in this EA. Regulatory requirements under the following programs, among others, are assessed:

- Noise Control Act of 1972
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- National Historic Preservation Act
- Archaeological Resources Protection Act
- Endangered Species Act (ESA) of 1973
- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation, and Liability Act
- Toxic Substances Control Act of 1970
- Occupational Safety and Health Act

Requirements would also include compliance with Executive Order (EO) 11988 (Floodplain Management); EO 11990 (Protection of Wetlands); EO 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Populations); EO 13045 (Protection of Children from Environmental Health Risks and Safety Risks); and EO 12372 (Intergovernmental Review of Federal Programs). Public notice and agency correspondence are presented in Appendix B.

1.8 Environmental Permit Requirements

If removal of an active migratory bird nest is necessary, a depredation permit from the U.S. Fish and Wildlife Service (USFWS) will be required.

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SECTION 2.0

Description of the Alternatives, Including the Proposed Action

2.1 Selection Criteria for the Proposed Action and Alternatives

To be considered a reasonable alternative, the Proposed Action must provide compliance with the directive of HQ AMC and Air Force policy for tree and vegetation management within the Runway 16/34 south approach-departure surface (50:1) north of Perimeter Road at McChord AFB.

Reasonable alternatives for achieving airspace safety in the Runway 16/34 south approach-departure surface at McChord AFB should meet the following criteria in a cost-effective manner and with minimal impact to human health and natural resources:

- Satisfy requirements for the safe operation of aircraft (UFC 3-260-1 and UFC 3-535-01)
- Minimize impacts to environmental resources
- Reduce the cost of measures taken to comply with the UFC
- Eliminate UFC violations without delay
- Ensure a long-term solution is implemented to address airfield obstructions

2.2 Description of Alternatives

2.2.1 Proposed Action – Clear Cut Select Areas in the Runway 16/34 South Approach Surface (50:1) North of Perimeter Road

According to the LIDAR survey, trees located in the on-base south approach-departure surface are currently violating or have the potential to violate the 50:1 imaginary surface. Under the Proposed Action, select areas of the Runway 16/34 south approach-departure surface (50:1) north of Perimeter Road, i.e., the proposed action area, (see Figure 1-2) would be subject to clear cutting. Areas of trees or vegetation identified by the LIDAR survey as violating the airspace imaginary surface would be clear cut.

Areas of vegetation that are identified or selected, using a combination of LIDAR data and unaided visual observation in the field, as not violating the 50:1 imaginary surface would receive a ground vegetative survey to determine, based on topography and vegetative type, whether any potential exists for the trees or vegetation to violate the 50:1 imaginary surface and/or light plane. The following course of action would be taken:

- Areas in which trees or vegetation do not have the potential to violate the 50:1 imaginary surface and light plane would not be clear cut.

- Areas of vegetation identified as actually or potentially violating the 50:1 imaginary surface and light plane would be clear cut. The vegetation management plan includes replacement of trees with low-growing trees or bushes that would not have the potential to penetrate the 50:1 imaginary surface.

Currently, trees in the Draper wetland are topped to ensure they do not penetrate the 50:1 imaginary surface. Under the Proposed Action, these trees would continue to be topped rather than clear cut.

Although existing trees will be removed from select areas, seedlings will re-emerge in the area because other trees remain nearby. Implementation of the Proposed Action would require continued aggressive management practices to ensure emerging vegetation does not penetrate (10 feet below) the 50:1 imaginary surface or the light plane or both. Vegetation management will be conducted to minimize the attraction of fauna and associated Bird/Wildlife Aircraft Strike Hazard (BASH) risks.

2.2.2 Alternative 1 – Clear Cut all Trees and Vegetation Currently Violating or having the Potential to Violate the Runway 16/34 South Approach-Departure Surface (50:1) North of Perimeter Road

This proposal entails clear cutting all trees within the Runway 16/34 south approach-departure surface (50:1) north of Perimeter Road. Areas where clear cutting has occurred would be maintained as grassland, and replanting of trees in these areas would not be permitted. Long-term maintenance would include additional tree removal in future years. Vegetation management will be conducted to minimize the attraction of fauna and associated BASH risks.

2.2.3 Alternative 2 – Remove Individual Trees in the Runway 16/34 South Approach Surface (50:1) North of Perimeter Road

Alternative 2 consists of removing individual trees in the airspace imaginary surface (50:1) and light plane in the proposed action area. A timber survey would be conducted to identify individual trees actually or potentially violating the 50:1 slope criteria by height and location. All trees or other vegetation violating or having the potential to violate the 50:1 slope criteria would be removed.

The LIDAR survey would be useful only to identify the general area in which individual violations are located. No clear cutting would occur; only individual trees would be cut and removed. Surveying, measurement, and field work would be necessary to accurately identify individual trees in violation or with the potential to violate UFC 3-260-1 and UFC 3-535-01 Criteria. To be in full compliance with the AMC directive and Air Force policy, all trees identified in the survey with actual or potential height within 10 feet below the elevation of the airspace imaginary surface (50:1) would be removed.

Prior to the field timber survey, a graduated scale for appropriate height criteria will be developed to initially guide the survey. The timber survey would include field demarcation of the airspace imaginary surface and identification of specific trees violating the 50:1 slope criteria within the project area borders. The survey would use optical instruments such as clinometers, relascopes, hypsometers, or other suitable devices to identify actual and

potential violations. Trees would be marked for removal with survey paint. Working in teams of two people (one to measure and one to mark the tree), surveys of this type generally require 3 to 5 person-minutes per tree once the team is deployed in the field. The total amount of time required to complete the survey would depend upon the number of trees to be measured. Only trees with a reasonable potential for violating the airspace imaginary surface elevation would be measured. The estimated field time needed to complete the survey work ranges from several person-days to a person-week. To ensure survey accuracy, a certified forester or workers under the supervision of a certified forester should conduct the survey.

Vegetation management includes replacement of trees that are removed with lower-growing trees or bushes that would not have the potential to penetrate the 50:1 imaginary surface. Vegetation management will be conducted to minimize the attraction of fauna and associated BASH risk. Currently, deciduous trees in the Draper wetland are topped to ensure they do not penetrate the 50:1 imaginary surface. Under Alternative 2, these trees would continue to be topped rather than clear cut.

Although all existing trees with the potential to penetrate the 50:1 surface will be removed, seedlings will re-emerge in the area because similar trees remain in the area. Implementation of Alternative 2 would require additional tree removal in the future to ensure that new vegetation does not have the potential to penetrate the 50:1 imaginary surface. Because fewer trees would likely be removed under this scenario initially, periodic surveys and tree removal might need to be repeated more frequently. Evaluation of the potential to violate the 50:1 imaginary surface might include a survey of vegetation types and locations as well as additional LIDAR surveys, estimated to cost over $200,000 per survey (McChord AFB, 2005a).

2.2.4 No Action Alternative

Inclusion of the No Action Alternative is carried forward in accordance with 32 CFR 989.8(d) for consideration. Although the No Action Alternative does not satisfy the purpose and need for the Proposed Action, it serves as a baseline against which the impacts of the Proposed Action and its alternatives can be evaluated.

Under the No Action Alternative, the Air Force would take no action to remove or otherwise manage the trees and vegetation in the Runway 16/34 south approach-departure surface on McChord AFB property that are in violation of the 50:1 airspace imaginary surface.

2.3 Alternatives Considered but Eliminated from Detailed Study

Consideration was given to alternatives that included application for a waiver for the south approach-departure 50:1 airspace imaginary surface. However, failure to remove the tree obstructions in this surface would eliminate CAT II ILS capability and critically impair McChord AFB's ability to carry out its mission.

Topping of Douglas-firs, which constitute the bulk of the trees to be removed, was eliminated from detailed analysis in this EA because coniferous trees will die if topped and become a ground hazard.

2.4 Description of Past and Reasonably Foreseeable Future Actions Relevant to Cumulative Impacts

This EA identifies actions that have been conducted in the past, activities that are ongoing or in the planning stages, and future actions that are related to the environmental consequences of the Proposed Action. Details of the actions that could interact with the Proposed Action are included in Section 4.17.

2.5 Identification of the Preferred Alternative

The preferred alternative is the Proposed Action described in Section 2.2.1. The Proposed Action best meets the selection criteria identified in Section 2.1 by satisfying UFC requirements and minimizing environmental impacts, e.g., not clear cutting trees in the Draper wetland.

2.6 Comparison of the Environmental Impacts of Alternatives

Table 2-1 compares the environmental impacts of the alternatives described above.

TABLE 2-1
Summary of Potential Physical, Biological, Cultural, and Socioeconomic Consequences
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

	Potential Consequences			
Resource	**No Action Alternative**	**Proposed Action**	**Alternative 1**	**Alternative 2**
Air Quality	No impact.	Minor, temporary impacts from logging equipment exhaust emissions during logging activities. Emissions would not have a significant impact on air quality.	Minor, temporary impacts from logging equipment exhaust emissions during logging activities. Emissions would not have a significant impact on air quality	Minor, temporary impacts from logging equipment exhaust emissions during logging activities. Emissions would not have a significant impact on air quality
Noise	No impact.	Short-term increase in noise levels during tree felling. Based on the temporary nature of logging activities, elevated ambient noise because of proximity to the flight line, and distance to the nearest residential area, no significant adverse impacts would occur.	Short-term increase in noise levels during tree felling. Based on the temporary nature of logging activities, elevated ambient noise because of proximity to the flight line, and distance to the nearest residential area, no significant adverse impacts would occur.	Short-term increase in noise levels during tree felling. Based on the temporary nature of logging activities, elevated ambient noise because of proximity to the flight line, and distance to the nearest residential area, no significant adverse impacts would occur.
Wastes, Hazardous Materials and Stored Fuels	No impact.	No impact on facilities that generate waste, use hazardous materials, or store or use fuels. Potential for accidental spills of oil or fuels during logging operations would be minimized through the use of best management practices. Contingency measures would be implemented in case of inadvertent discovery of hazardous waste.	No impact on facilities that generate waste, use hazardous materials, or store or use fuels. Potential for accidental spills of oil or fuels during logging operations would be minimized through the use of best management practices. Contingency measures would be implemented in case of inadvertent discovery of hazardous waste.	No impact on facilities that generate waste, use hazardous materials, or store or use fuels. Potential for accidental spills of oil or fuels during logging operations would be minimized through the use of best management practices. Contingency measures would be implemented in case of inadvertent discovery of hazardous waste.
Topography and Soils	No impact.	Movement of heavy logging equipment and dragging of cut logs could create ruts in soil. Erosion potential is limited because soils are well-drained, the area is generally flat outside of the wetland, and slash would be left in place, slowing erosive runoff. Trees within the wetland would not be removed but would be topped.	Movement of heavy logging equipment and dragging of cut logs could create ruts in soil. Erosion potential is limited because soils are well-drained, the area is generally flat outside of the wetland, and slash would be left in place, slowing erosive runoff. Removal of trees in the wetland area could potentially result in minor erosion along steeper slopes due to higher surface runoff velocities.	Movement of heavy logging equipment and dragging of cut logs could create ruts in soil. Erosion potential is limited because soils are well-drained, the area is generally flat outside of the wetland, and slash would be left in place, slowing erosive runoff. Trees within the wetland would not be removed but would be topped.

TABLE 2-1
Summary of Potential Physical, Biological, Cultural, and Socioeconomic Consequences
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

	Potential Consequences			
Resource	**No Action Alternative**	**Proposed Action**	**Alternative 1**	**Alternative 2**
Water Resources				
• Surface Water	No impact.	No impact because no surface water resources are present within the proposed action area.	No impact because no surface water resources are present within the proposed action area.	No impact because no surface water resources are present within the proposed action area.
• Groundwater	No impact.	No significant impact because use of hazardous materials would be managed to minimize the potential for a release, there would be no increase in impervious surfaces, and any soil compaction would be localized and minimal.	No significant impact because use of hazardous materials would be managed to minimize the potential for a release, there would be no increase in impervious surfaces, and any soil compaction would be localized and minimal.	No significant impact because use of hazardous materials would be managed to minimize the potential for a release, there would be no increase in impervious surfaces, and any soil compaction would be localized and minimal.
• Floodplains	No impact.	No impact because the proposed action area is not within a floodplain.	No impact because the proposed action area is not within a floodplain.	No impact because the proposed action area is not within a floodplain.
Biological Resources				
• Vegetation	No impact.	Adverse effects would result from the elimination of Garry oak habitats and associated dependent wildlife. Beneficial impacts would potentially result from felling of invasive Douglas-fir. Tree removal could allow establishment of other invasive species without additional post-harvest management.	Adverse effects would result from the elimination of Garry oak habitats and associated dependent wildlife. Beneficial impacts would potentially result from felling of invasive Douglas-fir. Tree removal could allow establishment of other invasive species without additional post-harvest management.	Adverse effects would result from the elimination of Garry oak habitats and associated dependent wildlife. Beneficial impacts would potentially result from felling of invasive Douglas-fir. Tree removal could allow establishment of other invasive species without additional post-harvest management.
• Wetlands	No impact.	No wetland impacts would result because trees in the Draper wetland would continue to be topped rather than felled in their entirety, consistent with current management practice.	Changes to existing wetland habitat function would occur in the Draper wetland due to removal of all woody vegetation, with moderate reduction of water quality functions. The Draper wetland is not believed to be a jurisdictional wetland and therefore impacts would not be regulated. Conformance with EO 11990 would be required.	No wetland impacts would result because trees would be topped rather than felled in their entirety, consistent with current management practice.

TABLE 2-1
Summary of Potential Physical, Biological, Cultural, and Socioeconomic Consequences
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

	Potential Consequences			
Resource	**No Action Alternative**	**Proposed Action**	**Alternative 1**	**Alternative 2**
• Wildlife	No impact.	Change in vegetation structure will reduce nesting and breeding habitat for neotropical migratory bird populations, causing an adverse impact for wildlife populations. Tree removal action should be timed to avoid impact on migratory bird nests under the Migratory Bird Treaty Act (MBTA).	Change in vegetation structure will reduce nesting and breeding habitat for neotropical migratory bird populations, causing an adverse impact for wildlife populations. Tree removal action should be timed to avoid impact on migratory bird nests under the Migratory Bird Treaty Act.	Change in vegetation structure will reduce nesting and breeding habitat for neotropical migratory bird populations, causing an adverse impact for wildlife populations. Tree removal action should be timed to avoid impact on migratory bird nests under the Migratory Bird Treaty Act.
• Protected Species	No impact.	Some species would be adversely affected through felling of existing forested communities, while others may experience habitat enhancement through expansion of open grassland and shrub communities. Potential positive impact on habitat for willow flycatcher and streaked horned lark. Habitat reduction for long-legged myotis and long-eared myotis.	Some species would be adversely affected through felling of existing forested communities, while others may experience habitat enhancement through expansion of open grassland and shrub communities. Potential positive impact on habitat for willow flycatcher and streaked horned lark. Habitat reduction for long-legged myotis and long-eared myotis.	Some species would be adversely affected through felling of existing forested communities, while others may experience habitat enhancement through expansion of open grassland and shrub communities. Potential positive impact on habitat for willow flycatcher and streaked horned lark. Habitat reduction for long-legged myotis and long-eared myotis.
Socioeconomics	No impact.	No significant impact because no additional hires or personnel relocations would occur, and only a small number of temporary jobs would be created.	No significant impact because no additional hires or personnel relocations would occur, and only a small number of temporary jobs would be created.	No significant impact because no additional hires or personnel relocations would occur, and only a small number of temporary jobs would be created.
Cultural Resources	No impact.	No impact because no trees would be felled near the only cultural resource within the proposed action area (Building 300).	No impact because no trees would be felled near the only cultural resource within the proposed action area (Building 300).	No impact because no trees would be felled near the only cultural resource within the proposed action area (Building 300).
Land Use	No impact.	No impact because there would be no change to land use.	No impact because there would be no change to land use.	No impact because there would be no change to land use.

TABLE 2-1
Summary of Potential Physical, Biological, Cultural, and Socioeconomic Consequences
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

	Potential Consequences			
Resource	**No Action Alternative**	**Proposed Action**	**Alternative 1**	**Alternative 2**
Utility Infrastructure	No impact.	No impact because the only utilities that exist in the proposed action area are two underground electrical lines that can be avoided during tree removal.	No impact because the only utilities that exist in the proposed action area are two underground electrical lines that can be avoided during tree removal.	No impact because the only utilities that exist in the proposed action area are two underground electrical lines that can be avoided during tree removal).
Transportation	No impact.	No significant impact because there would be no modification of any transportation system and only a small, temporary impact on traffic at McChord AFB.	No significant impact because there would be no modification of any transportation system and only a small, temporary impact on traffic at McChord AFB.	No significant impact because there would be no modification of any transportation system and only a small, temporary impact on traffic at McChord AFB.
Airspace/Airfield Operations	Would result in unsafe conditions for aircraft and the need to shut down McChord AFB CAT II ILS, impairing Base mission.	Would prevent base mission impairment by allowing continued safe operation of aircraft, including Base CAT II ILS.	Would prevent base mission impairment by allowing continued safe operation of aircraft, including Base CAT II ILS.	Would prevent base mission impairment by allowing continued safe operation of aircraft, including Base CAT II ILS.
Safety and Occupational Health	Safety and occupational health for pilots, crews, and passengers would be compromised and would continue to degrade as trees grow taller.	Would enhance safe aircraft operation and result in a positive impact on safety and occupational health. Logging operations would be conducted using safe operating procedures to minimize the potential for accidents.	Would enhance safe aircraft operation and result in a positive impact on safety and occupational health. Logging operations would be conducted using safe operating procedures to minimize the potential for accidents.	Would enhance safe aircraft operation and result in a positive impact on safety and occupational health. Logging operations would be conducted using safe operating procedures to minimize the potential for accidents.
Environmental Management				
• Pollution Prevention	No impact.	No significant impact because there would be no change to current practices, and standard Best Management Practices would be implemented to ensure that no release of fuels occurs during logging operations.	No significant impact because there would be no change to current practices, and standard Best Management Practices would be implemented to ensure that no release of fuels occurs during logging operations.	No significant impact because there would be no change to current practices, and standard Best Management Practices would be implemented to ensure that no release of fuels occurs during logging operations.
• Installation Restoration Program (IRP)	No impact.	No impact because no IRP sites are present within the proposed action area.	No impact because no IRP sites are present within the proposed action area.	No impact because no IRP sites are present within the proposed action area.

TABLE 2-1
Summary of Potential Physical, Biological, Cultural, and Socioeconomic Consequences
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

	Potential Consequences			
Resource	**No Action Alternative**	**Proposed Action**	**Alternative 1**	**Alternative 2**
Environmental Justice and Protection of Children	No impact.	No significant impacts associated with air quality, noise, groundwater, surface water, or hazardous materials and wastes. As a result, no disproportionate impacts to minorities, low-income residents, or children less than 17 years of age.	No significant impacts associated with air quality, noise, groundwater, surface water, or hazardous materials and wastes. As a result, no disproportionate impacts to minorities, low-income residents, or children less than 17 years of age.	No significant impacts associated with air quality, noise, groundwater, surface water, or hazardous materials and wastes. As a result, no disproportionate impacts to minorities, low-income residents, or children less than 17 years of age.

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SECTION 3.0

Affected Environment

3.1 Introduction

This section describes the existing environmental conditions at McChord AFB for resources potentially affected by implementation of the Proposed Action or alternative tree removal operations. The expected geographic scope of potential impacts is generally limited to the airfield and immediate vicinity, unless otherwise specified. In compliance with NEPA guidelines and implementing regulations, including 32 CFR 989, the description of the affected environment focuses on the resources potentially subject to impacts.

3.2 Air Quality

3.2.1 Climate

The general climate conditions described here are based on information provided in *Climates of the States (*Gale Research Company, 1980), with updates provided by meteorological sites operated by the Western Regional Climate Center. The Puget Sound region has a mild, marine-influenced climate with mild, wet, and cloudy winters and cool summers. Occasionally, during the winter season, cold air from the interior of Canada flows southward through the Fraser River canyon and over the northern Puget Sound lowland. Inversion layers can form during the months of January, February, October, November, and December. The prevailing wind direction is south or southwest during the wet season (winter) and north or northwest during the summer. Occasional severe winter storms produce strong northerly winds; however, the average wind velocity in the area is less than 10 miles per hour. The summer is characterized by moderate temperatures and light, variable winds from the north.

3.2.2 Current Air Quality

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) pursuant to CAA Sections 109 and 301(a). These standards, expressed in micrograms per cubic meter, establish safe concentration levels for each criteria pollutant. The NAAQS have been set for six criteria pollutants: carbon monoxide (CO); nitrogen dioxide; ozone (O_3); sulfur oxides, measured as sulfur dioxide; lead; and two types of particulate matter: particulate matter less than or equal to 10 microns in aerodynamic diameter (PM_{10}) and particulate matter less than or equal to 2.5 microns in aerodynamic diameter ($PM_{2.5}$).

The CAA requires that air quality regions be designated according to their status with respect to the NAAQS for each criteria pollutant, usually by county or Metropolitan Statistical Area (MSA). Areas that meet the NAAQS are designated attainment, while those not meeting the NAAQS are designated non-attainment for the specific pollutant. An area

that is re-designated from non-attainment to attainment based on improvements to air quality is designated as a maintenance area.

McChord AFB is located in Pierce County in the Puget Sound Clean Air Agency's jurisdiction. Pierce County is currently designated as attainment, i.e., meets the EPA air quality standards for all criteria pollutants (60 *Federal Register* 62748, 7 December 1995). Table 3-1 provides a summary of the measured air concentrations of criteria pollutants in 2005 at several monitoring stations in Pierce County. These data show that concentrations are below the NAAQS at all stations for each pollutant measured. Pierce County is currently a maintenance area for CO. Although a portion of Pierce County is a maintenance area for PM_{10}, the area surrounding the Proposed Action site is not a maintenance area for PM_{10}.

TABLE 3-1
Measured Air Concentrations of Criteria Pollutants in Pierce County, 2005
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

	Ambient Air Quality Standards		2005 Monitoring Results					
Pollutant	**National**	**Washington State**	**30525 Mud Mountain Road, Enumclaw**	**Port of Tacoma, 2301 Alexander Avenue, Tacoma**	**7802 South L Street, Tacoma**	**South Hill, 9616 128th Street East, Puyallup**	**James Street & Central Avenue, Kent**	**1101 Pacific Avenue, Tacoma**
PM_{10} Annual	50 µg/m^3	50 µg/m^3	NC	22.7	NC	NC	19.8	NC
PM_{10} 24-Hour	150 µg/m^3	150 µg/m^3	NC	75	NC	NC	58	NC
$PM_{2.5}$ Annual	15 µg/m^3	15 µg/m^3	NC	11.5	11.5	NA[b]	9.7	NC
$PM_{2.5}$ 24-Hour	65 µg/m^3	65 µg/m^3	NC	49	46	33	48	NC
Ozone 1-Hour	0.12 ppm	0.12 ppm	0.087	NC	NC	NC	NC	NC
Ozone 8-Hour[a]	0.08 ppm	None	0.072	NC	NC	NC	NC	NC
CO 1-Hour	35 ppm	35 ppm	NC	NC	NC	NC	NC	6.6
CO 8-Hour	9 ppm	9 ppm	NC	NC	NC	NC	NC	4.6

[a] Eight-hour ozone standard went into effect on September 16, 1997, but implementation is limited.
[b] Not applicable. Not enough data collected to give an annual mean.

Note:

NC = data point not collected at the site.

McChord AFB operates under synthetic minor emission limits under the CAA Title V Air Operating Program. The Puget Sound Clean Air Agency is responsible for issuing and enforcing the CAA Title V Synthetic Minor Limits in the Regulatory Order for NC No. 9364 (issued 27 July 2006) for McChord AFB.

3.3 Noise

The primary sources of noise at McChord AFB are airfield operations, industrial activities, and vehicular traffic. The McChord AFB AICUZ program (McChord AFB, 1998a) provides noise contours for airfield operations at McChord AFB. The noise contours for McChord AFB have been developed using the Department of Defense (DoD) NOISEMAP® (Version 6.5) and are presented in decibels on the A-weighted scale (dBA) as day-night average sound level (DNL). The DNL metric accounts for the greater annoyance from noise during nighttime hours and is calculated by averaging hourly sound levels for a 24-hour period and adding a weighting factor to the nighttime values.

The noise guidelines established for land use planning at McChord AFB are similar to those published in *Guidelines for Considering Noise in Land-Use Planning and Control* (Federal Interagency Committee on Urban Noise, 1980). According to these guidelines, the maximum acceptable noise level for most residential land uses is considered to be 65 dBA DNL. According to the McChord AFB AICUZ data, airfield operations produce noise levels that range from 65 to 80 dBA DNL on a typical busy day. The 65-dBA DNL contour covers the main runway and extends about 2 miles north into Tacoma and about 2 miles south onto the Fort Lewis Military Reservation.

Washington Administrative Code (WAC) 173-60 provides the applicable noise standards for Washington State and establishes maximum permissible environmental noise levels. These levels are based on the environmental designation for noise abatement (EDNA), which is defined as "an area or zone (environment) within which maximum permissible noise levels are established." There are three EDNA designations (WAC 173-60-030), which roughly correspond to residential, commercial/recreational, and industrial/agricultural uses, as follows:

- Class A: Lands where people reside and sleep (such as residential)
- Class B: Lands requiring protection against noise interference with speech (such as commercial/recreational)
- Class C: Lands where economic activities are of such a nature that higher noise levels are anticipated (such as industrial/agricultural)

As used in this document, "noise-sensitive areas" are equivalent to Class A EDNA areas. Table 3-2 summarizes the maximum permissible levels applicable to noise received at noise-sensitive areas (Class A EDNA) and at industrial/agricultural areas (Class C EDNA) from an industrial facility (Class C EDNA).

Land use within the proposed action area includes primarily land designated for airfield use. The nearest residential area is located approximately 1,800 feet east of the proposed action area. Forested recreational land separates the proposed action area from the town of Spanaway to the east. Land use is discussed in detail in Section 3.10.

TABLE 3-2
State of Washington Noise Regulations (WAC 173-60-040)
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

	Maximum Permissible Noise Level (dBA) from a Class C EDNA		
	Class A EDNA Receiver		Class C EDNA Receiver
Statistical Descriptor	Daytime (7 a.m. – 10 p.m.)	Nighttime (10 p.m. – 7 a.m.)	Anytime
L_{eq}	60	50	70
L_{25}	65	55	75
$L_{16.7}$	70	60	80
$L_{2.5}$	75	65	85

Notes:

Standard applies at the property line of the receiving property.

L_{eq} = Equivalent noise level. The energy average A-weighted noise level during the measurement period.

L_n = Percentile noise level. The A-weighted noise level exceeded during n % of the measurement period, where n is a number between 0 and 100 (e.g., L_{90}).

The following are exempted from the limits listed in Table 3-2 (WAC 173-60-050):

- Construction noise between the hours of 7 a.m. and 10 p.m.
- Motor vehicles when regulated by 173-62 WAC ("Motor Vehicle Noise Performance Standards" for vehicles operated on public highways).
- Motor vehicles operated off public highways, except when such noise affects residential receivers.

All noise-generating activities are associated with the equipment to be used for the tree removal efforts and will be conducted between the hours of 7 a.m. and 10 p.m. Therefore, these activities are exempt from the limits presented in Table 3-2 (per 173-60-050 WAC).

3.4 Wastes, Hazardous Materials, and Stored Fuels

According to the McChord AFB General Plan (Higginbotham Briggs and Associates, 2005), hazardous materials used on McChord AFB include petroleum fuels, flammable solvents, acids, caustics, pesticides, and a number of other materials. Hazardous materials are managed through the centralized Base HAZMAT Pharmacy. Hazardous wastes include spent solvents and used battery acid.

McChord AFB is classified as a large quantity generator of hazardous wastes (over 1,000 kilograms of waste generated per month), and does not have a RCRA Part B Storage Permit. Therefore, containers of wastes must be removed from McChord AFB in less than 90 days from the accumulation date shown on the container. Satellite hazardous waste accumulation points are located in or near the facilities in which the wastes are generated.

Ninety-day storage facilities where containers from satellite facilities are accumulated for pickup are located in Buildings 10, 14, 18, and 562. None of these storage facilities are located within or adjacent to the proposed action area. Building 303 is also designated as a 90-day accumulation point, but it is not currently in use. Facility 1178 (62LGILGLO Washrack) is also an authorized 90-day accumulation point for washrack rinsate. A contractor picks up wastes from the 90-day facilities and transports them to the RCRA permitted Defense Reutilization and Marketing Office (DRMO) on Fort Lewis (Higginbotham Briggs and Associates, 2005). Petroleum fuels, oils, antifreeze, and batteries turned in to DRMO are sold for reprocessing or recycling (Higginbotham Briggs and Associates, 2005). Hazardous materials at McChord AFB are managed in accordance with the McChord AFB Hazardous Waste Management Plan (McChord AFB, 1999).

The south approach-departure surface is undeveloped and is not a site where wastes are generated, hazardous materials are used, or fuels are stored or used.

3.5 Topography and Soils

The only Soil Conservation Service (SCS) soil survey that included McChord AFB was done from 1937 to 1939. However, this soil survey did not identify soil types for some areas of McChord AFB, such as wetlands. In 1979, the SCS published a soil survey for Pierce County that did not include McChord AFB.

The most common soil type found on McChord AFB is Spanaway gravelly sandy loam. This soil is somewhat excessively drained, has a high rock content (typically 50 percent) and is found in nearly level to undulating terrain. It developed in glacial outwash mixed in the upper part with volcanic ash. The soil type supports grass, hardwood, and conifers. The soil is characterized by strong to slight acidity, moderately rapid permeability, low water availability capacity, slow surface water runoff, little erosion hazard, and an effective rooting depth of more than 4 feet. The Spanaway association is used for urban development, woodland, and native grazing land. This association is a good source for construction gravel.

Other soil types on McChord AFB include DuPont muck, a very poorly drained, level, organic soil, and Everett gravelly sandy loam, a somewhat excessively drained soil on nearly level to undulating terrain. Fill and borrow areas are also located on McChord AFB (McChord AFB, 2003a).

The topography of the proposed action area is relatively flat, with a total elevation change of approximately 50 feet across the site (excluding the Draper wetland). The elevation drop from the surrounding land surface to the bottom of the wetland is approximately 17 feet.

3.6 Water Resources

Water resources include both surface water and groundwater. Surface water includes all the lakes, rivers, streams, and wetlands within a watershed. Groundwater includes aquifers.

Water resources described in this section include the watersheds and aquifers associated with the proposed action area. Flood hazards associated with the 100-year floodplain are also addressed in this section.

3.6.1 Surface Water

Most of McChord AFB is within the Clover Creek drainage. Clover Creek is joined by Morey Creek east of the flight line and then flows beneath the airfield emerging near Vista Drive before flowing off Base to the west and into Steilacoom Lake approximately 2.6 miles away. Chambers Creek connects Steilacoom Lake with Puget Sound.

The highly permeable nature of the surface soil throughout McChord AFB allows rapid infiltration of precipitation with little or no surface flow and only occasional, short-term accumulation of water in ponds or wetlands. Within the proposed action area, no streams, ponds, or lakes have been identified. One wetland area has been identified within the proposed action area and is discussed in Section 3.7.2. The wetland area is located in an isolated depression and is not drained by streams.

3.6.2 Stormwater

Stormwater runoff rates across McChord AFB are relatively low (0.05 to 0.09 cubic feet per second/acre for the 100-year, 24-hour storm event), and erosion is generally minor because of the high permeability of the Spanaway gravelly sandy loam soil surface (Higginbotham Briggs and Associates, 2005).

The outfalls closest to the proposed action area are located to the west. No outfalls are located within the proposed action area, and no stormwater collection is conducted in the proposed action area.

3.6.3 Groundwater

The *Integrated Natural Resources Management Plan* (INRMP) (McChord AFB, 2003a) describes groundwater resources at McChord AFB. The following discussion is summarized from the INRMP and the Cross-Base Highway Final EIS (U.S. Department of Transportation [USDOT] et al., 2003).

The proposed action area is underlain by two aquifer systems: (1) a shallow, unconfined groundwater system (Vashon Drift) and (2) a deep groundwater system (Salmon Springs Aquifer), separated by the low-permeability Kitsap Formation. Taken together, these aquifers comprise the Central Pierce County Sole-Source Aquifer. The Kitsap Formation serves as an aquitard, separating the aquifers into upper and lower groundwater systems.

According to the INRMP, depth to the shallow, unconfined aquifer (water table) beneath most of McChord AFB is between 10 and 40 feet. The water table elevation fluctuates seasonally from 2 to 10 feet, with the highest levels in early spring and lowest levels in late summer/early fall, following the dry season. Groundwater flows primarily toward the northwest in the unconfined (upper) aquifer. However, local flow varies from westerly to northerly. Flow gradients are highly variable, but average about 25 feet per mile.

The Salmon Springs Aquifer is bounded below by the Puyallup Aquitard. Within the aquifer, the Salmon Springs Till is a laterally discontinuous aquitard unit within this aquifer. It is absent in some spots beneath McChord AFB. The Salmon Springs Aquifer may act as two distinct aquifers where the till is present. The predominant flow direction within the Salmon Springs Aquifer is to the north or northwest (McChord AFB, 2003a).

3.6.4 Floodplains

EO 11988, Floodplain Management (signed May 24, 1977), directs federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains.

The Federal Emergency Management Agency (FEMA) has delineated floodplain areas on flood insurance rate maps. According to the flood insurance rate maps that cover McChord AFB, none of the land on-base is within the 100-year coastal floodplain. The U.S. Army Corps of Engineers (USACE) has mapped a 100-year floodplain on base associated with Clover Creek, which runs north of the proposed action area. The proposed action area is not within the USACE floodplain.

3.7 Biological Resources

Significant biological resources at McChord AFB include vegetation, wetlands, wildlife, and protected plant and animal species. Information on biological resources on McChord AFB is provided in the McChord AFB INRMP (McChord AFB, 2003a).

The McChord AFB General Plan (Higginbotham Briggs and Associates, 2005) describes the south approach-departure surface as some of the most ecologically diverse habitat on McChord AFB. The south approach-departure surface is contiguous with similar habitat on Fort Lewis, and the combined acreage contains the largest remaining block of natural landscape in the Puget Trough Ecoregion (USDOT et al., 2003). The proposed action area covers only the northern portion of the south approach-departure surface, north of perimeter road, and the following discussion focuses on that area.

Biological resources include native and non-native plant and animal species (vegetation and wildlife) and the habitats within which they occur. For this EA, these resources are divided into vegetation, wetlands, wildlife, and protected plant and animal species. Figure 3-1 shows vegetation communities within the proposed action area.

3.7.1 Vegetation

Vegetation community types within the proposed action area include Garry oak woodlands, Douglas-fir woodlands, and one wetland area. Habitats of several state or federally sensitive plant and wildlife species also are present (McChord AFB, 2003a; The Nature Conservancy [TNC], 1996a; TNC, 1996b). Figure 3-1 shows the various vegetation community types in the proposed action area. Wetlands are discussed in Section 3.7.2. Threatened and endangered plant species and other special-status plant species are discussed in general below and described in Section 3.7.4.

McChord AFB was constructed within the Nisqually Plains gravelly prairie vegetation type. The Nisqually Plains are endemic to Western Washington in the south end of the Puget Sound Basin. These areas comprise about 150,000 acres in Pierce and Thurston Counties. Prairies developed on the glacial outwash plains of the Vashon Glacier that retreated 6,000 to 10,000 years ago. The Spanaway Prairie, one of the Nisqually Plains gravelly prairies, developed on the Spanaway gravelly sandy loam soils and originally covered the McChord AFB area. Historically, vegetation in the McChord AFB vicinity consisted of a combination of drought-tolerant prairie grasslands, oak woods, and ponderosa pine (*Pinus ponderosa*) forests, often called savannahs, with some emergent marsh and forested wetlands. Idaho fescue (*Festuca idahoensis*) grasslands and Garry oak (*Quercus garryana*) stands colonized the area after the retreat of the Vashon glaciation (McChord AFB, 2003a).

Native Garry oak (also known as Oregon white oak) and ponderosa pine habitats remaining on McChord AFB represent significant remnants of the original Puget Sound landscape. As these habitats are reduced in extent through urbanization and agriculture, remaining stands are managed to retain habitat for rare native plants and wildlife and to facilitate natural ecological processes. These communities require comprehensive management because they represent rare plant associations that are increasingly affected by management and development activities.

Currently, Douglas-fir (*Pseudotsuga menziesii*) and Scotch broom (*Cytisus scoparius*) are encroaching on the original Garry oak and ponderosa pine communities on McChord AFB. Long-term land management techniques, including fire suppression, have favored the establishment of Douglas-fir in the oak and ponderosa pine woodlands communities.

High-quality native prairies are naturally fire-maintained and, as such, resist the invasion of nonnative species provided the ground is not disturbed. However starting in the 1800s, areas within and surrounding McChord AFB experienced a rapid change in vegetation composition as a result of fire suppression, tilling, grazing, and the introduction of non-native species. Plants normally suppressed by fire, including Douglas-fir and exotic species such as Scotch broom, began to invade and eventually dominate McChord AFB plant communities (McChord AFB, 2003a). Garry oak is intolerant of shade when overtopped by Douglas-fir and associated conifers, and is eliminated from forest stands as the conifer canopy closes and remnant oak trees die (U.S. Department of Agriculture [USDA], 2004). As a result of development and species invasion, the original prairie community within the Puget Trough region has been reduced to only 10 percent of its former extent and only 3 percent of the remnant community is dominated by native plants. Remnant stands of ponderosa pine savannahs and Garry oak woodlands currently exist on McChord AFB (McChord AFB, 2003a).

3.7.1.1 Managed Forest Stands

The McChord AFB INRMP describes 873 acres of 21 managed forest stands from an inventory conducted in the early 1990s (McChord AFB, 2003a). A portion of Stand 4 (less than 1 acre) is located along the eastern boundary of the proposed action area. Stand 4 is described as a stand of Douglas-fir with trees that are up to 75 to 90 years old. Native oaks growing on forested edges are expected to persist until encroachment and shading from Douglas-fir eliminates them. Ponderosa pine individuals are also associated with open stands of Douglas-fir. The understory of Douglas-fir community types is typically sparse

and often dominated by Oregon grape (*Mahonia aquifolium*), sword fern (*Polystichum munitum*), and snowberry (*Symphoricarpos albus*). In addition to the managed stands identified in the early 1990s, several stands of Douglas-fir and Garry oak are present within the study boundaries.

Ponderosa pine and Douglas-fir have been reported to reach a maximum height of 233 feet and 200 feet, respectively (USDA NRCS, 2006), although these heights are not specific to McChord AFB or Spanaway soils. Site index information that includes plant growth response to site-specific soil conditions indicates that Douglas-fir will reach a height of 126 feet in 50 years while growing on Spanaway gravelly sandy loam soils in Pierce County (Zulauf, 1979). No site index information for ponderosa pine in Spanaway soils is available although McChord biologists believe that maximum height of this species would be between 60 and 130 feet (McChord AFB, 2007a).

3.7.1.2 Garry Oak Stands

Garry oak and ponderosa pine woodlands were identified in the south approach-departure surface during a second forest inventory completed in 1996 by TNC. These Garry oak woodlands vary from dense to diffuse stands of small to moderate-sized Garry oak 20 to 30 feet in height. Common species associations have been identified and are described below. The variations in species composition of the Garry oak stands likely reflect differences in land management along with local soil moisture, microclimate, disturbance, and soil series variation.

Garry oak is a slow-growing, long-lived, native tree species that reaches a maximum height under favorable conditions of 80 feet (USDA NRCS, 2006). However, at sites with low nutrient content in soil, Garry oak may not exceed 25 feet in height at 100 years. The average height of Garry oak in the proposed action area is estimated to be 20 to 30 feet (TNC, 1996a). No site index information for Garry oak on Spanaway soils is available.

There are approximately 3 acres of Garry oak/serviceberry-sword fern stands. These stands occur primarily on slopes adjacent to kettle-hole wetlands. The dominant tree canopy species include Garry oak, Oregon ash, and Douglas-fir. In the Garry oak/serviceberry-sword fern stands, oak tends to be between 5 and 20 inches diameter at breast height (dbh) and are commonly the largest trees within the stands. Tree density is high, with a canopy coverage greater than 60 percent. Shrub species dominate the understory. Common species include snowberry, serviceberry (*Amelanchier alnifolia*), Indian plum (*Oemleria cerasiformis*), beaked hazelnut (*Corylus cornuta*), and sword fern.

There are 27 acres of Garry oak/sedge-hook violet stands. Many aspects of these stands retain components thought to be more common in historical open oak woodlands. Typically, tree canopy cover ranges from 10 to 75 percent, with Garry oak and Douglas-fir sharing dominance in the canopy. Oak density in the Garry oak/sedge-hook violet stands is high, with the majority of trees found in the 0 to 5 inches dbh range, suggesting regeneration within these stands. The understory is a mix of grassland and shrubs. Dominant shrub species include snowberry, serviceberry, Oregon grape, and Indian plum. Douglas-fir is also noted in the shrub layer as an invading species in these stands. Understories with open canopies composed of native grassland species are found including Idaho fescue, white-top aster (*Aster curtus)*, hook violet (*Viola adunca*), western buttercup (*Ranunculus occidentalis*), and western yarrow (*Achillea millefolium*). Scotch broom is most common in areas of open

canopy and in association with vetch (*Vicia sativa*), tall oatgrass (*Arrhenatherum elatius*), and other nonnative species.

Garry oak woodlands are associated with the following special-status species:

- Western gray squirrel (*Sciurus griseus*, federal species of concern/state threatened species)
- White-top aster (federal species of concern/state sensitive species (Washington Department of Natural Resources [WDNR], 2006)/National Heritage Program sensitive species),
- Valley silverspot (*Speyeria zerene bremnerii*, federal species of concern, state candidate: animal under review for listing)
- Neotropical migrant birds (Washington-Oregon Partners in Flight documented populations in decline or of special management concern; TNC, 1998, and TNC, 1996b)
- Adult northern red legged frogs (*Rana aurora aurora*, federal species of concern)
- Water howellia (*Howellia aquatilis*) in adjacent wetlands (state and federally listed as threatened; TNC, 2005)

These species are considered to be of special status and are addressed in Section 3.7.4. Most of these species have not been identified in the proposed action area, but the presence of Garry oak woodlands could provide habitat if they are in the vicinity.

A stand of Garry oak containing sedge and hook violet (*Viola adunca*) west of the Draper wetland (described in Section 3.7.2) was designated in the INRMP as a priority stand for forest management, with the goal of retaining habitat for rare native plants and wildlife. A fire in the late 1980s killed many smaller oak trees and left many snags in the stand west of the Draper wetland.

The WDNR (2006) identified several oak stands on its Habitats and Species Map. These oak woodlands are identified by WDNR as priority habitats for conservation and management. A priority habitat consists of a unique vegetation type or dominant plant species, a described successional stage, or a specific structural element. None of the priority habitats identified by WDNR are within the boundaries of the proposed action area. However, WDNR recognizes that significant natural features may be present of which they are not aware.

3.7.2 Wetlands

Wetlands on McChord AFB were inventoried and classified by TNC in 1994 (TNC, 1996a) using criteria in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation, 1989). One of the wetlands, known as the Draper wetland, is located south of the active runway and is within the boundaries of the proposed action area (see Figure 3-1). The USACE has determined neither the boundaries of the Draper wetland nor its jurisdictional status (McChord AFB, 2005b).

The one-acre Draper wetland was described as a kettle hole wetland in fairly good condition, worthy of protection based on a fairly large and diverse emergent community

(TNC, 1996b). Currently, the buffer around the Draper wetland meets or exceeds local buffer requirements. Trees in the wetland have been topped periodically and the area surrounding the Draper wetland has been mowed as part of current management practice within the Clear Zone (Graded Area).

Wetland soils in the Draper wetland are DuPont mucks (Zulauf, 1979). DuPont muck soils are characterized by a 13-inch-thick, saturated, black (5YR 2/1 rubbed), highly decomposed organic layer (muck). The soil profile continues to 16 inches as a dark reddish brown (5YR 3/4) diatomaceous earth and volcanic ash. Soil characteristics from 16 to 46 inches are black (5YR 2/1 rubbed) muck (USDA NRCS, 2004).

Wetlands within the south approach-departure surface boundaries are groundwater influenced systems and do not receive surface water inputs from creeks or streams. Seasonal inundation commonly is greater than several feet in depth and influences the distribution and diversity of wetland vegetation communities (TNC, 1996a).

The Draper wetland contains emergent, scrub-shrub, and forested wetland classes. The western half of the wetland was filled as part of the original runway construction (TNC, 1996a). Dominant plant species within the Draper wetland include Oregon ash (*Fraxinus latifolia*), Douglas spirea (*Spiraea douglasii*), and a diverse emergent community including little meadow foxtail (*Alopecurus aequalis*), common spikerush (*Eleocharis palustris*), small-fruited bulrush (*Scirpus microcapus*), and Western yellowcress (*Rorippa curvisilique*). The wetland is underlain with organic soils, and hydrologic regimes vary from saturated to seasonally flooded. The wetland is surrounded by a mowed herbaceous community encroached upon by Scotch broom. Directly east of the Draper wetland, a low hill feature is vegetated by Garry oak woodlands. Douglas-fir is subdominant within the woodland area (TNC, 2005).

3.7.3 Wildlife

Wildlife resources identified on McChord AFB include 131 bird, 36 mammal, 12 fish, 16 butterfly, 45 moth, 5 amphibian, and 3 reptile species (McChord AFB, 2003a; Leonard and TNC, 1996; TNC, 2006). The habitats found in and around wetland systems, oak woodlands, grasslands, and mature coniferous forests are attractive to a variety of wildlife during some portions of their life cycles. Surveys cataloging birds, amphibians, reptiles, mammals, butterflies, and moths have been conducted on McChord AFB. No fish species or fish habitat are present within the proposed action area.

McChord AFB is a developed military base; thus, wildlife species found on McChord AFB are largely those that are adapted to noise and human presence. Several reports addressing species and habitat inventories at McChord AFB have been prepared in conjunction with other projects. These reports include the following inventories or surveys:

- *Final Environmental Impact Statement, Cross-Base Highway (State Route 704), I-5 to SR 7, Lakewood and Pierce County, Washington* (USDOT et al., 2003).
- *Breeding Phenology, Nesting Success, Habitat Selection, and Census Methods for the Streaked Horned Lark in the Puget Lowlands of Washington* (Pearson, 2003)
- *Inventory of Wetlands, Species of Concern, and Sensitive Habitats* (TNC, 1996a)

- *Inventory of Species of Concern* (TNC, 1996a)
- *Assessment of Neotropical Migrant Landbirds* (TNC, 1998)
- *Survey of Amphibians and Reptiles* (Leonard and TNC, 1996)
- *Inventory of Moths and Butterflies* (TNC, 1999)
- Audubon Society Christmas bird counts, 1996 through 2001 (McChord AFB, 2003)
- Monitoring Avian Productivity and Survivorship (MAPS) surveys (MAPS, 1997, 1998, and 2001)
- *McChord AFB Base Mammal Inventory 2005-2006* (TNC 2006).

Special-status species are addressed in Section 3.7.4.

3.7.3.1 Birds

Several annual bird surveys have been conducted within south approach-departure surface boundaries since 1997. These surveys were located within the Bensten wetland area and the South Approach Zone, south of Perimeter Road, and were conducted in association with the MAPS program. Of the 131 bird species identified on base, 9 are special-status species (with federal or state status) and have been identified within the south approach-departure surface (TNC, 1996b, Table 1). These nine species are discussed in Section 3.7.4.

McChord AFB wetland habitats, oak woodlands, grasslands, and mature coniferous forests have been identified as priority habitat for neotropical migratory land birds (Environmental Management, 2003; TNC, 1996b). Neotropical migratory bird populations are noteworthy because of declining populations thought to be associated with habitat loss, fragmentation, predation, and parasitism. Fourteen neotropical migrant bird species recognized by the Washington and Oregon Partners in Flight Program as species in decline (SD), species of concern (SC), or of special management concern (MC) are found on McChord AFB (TNC, 1996b), as follows:

- Band-tailed pigeon *(Columba fasciata, SD)*
- Barn swallow *(Hirundo rustica, SD)*
- Chipping sparrow *(Spizella passerina, SD)*
- Golden-crowned kinglet *(Regulus satrape, SD)*
- Hermit warbler *(Dendroica occidentalis, MC)*
- Killdeer *(Charadrius vociferous, SD)*
- MacGillivray's warbler *(Oporornis tolmiei, SD)*
- Orange-crowned warbler *(Vermivora celata, SD)*
- Rufous hummingbird *(Selasphorous rufus, SD)*
- Solitary vireo (*Vireo solitarius, SD*)
- Townsend's warbler *(Dendroica townsendi, SC)*
- Vaux's swift *(Chaetura vauxi, MC)*
- Wilson's warbler *(Wilsonia pusilla, SD)*
- Yellow warbler *(Dendroica petechia, SD)*

3.7.3.2 Mammals

A variety of mammals have been documented to occur on McChord AFB. The most current information was generated by a Nature Conservancy mammal inventory (TNC, 2006). These mammals include:

- Virginia opossum *(Didelphis virginiana)*
- Vagrant shrew (*Sorex vagrans*)
- Trowbridge's shrew (*Sorex trowbridgii*)
- Shrew-mole (*Neurotrichus gibbsii*)
- Townsend's mole (*Scapanus townsendii*)
- California myotis (*Myotis californicus*)
- Little brown myotis (*Myotis lucifugus*)
- Long-legged myotis (*Myotis volans*)
- Yuma myotis (*Myotis yumanensis*)
- Hoary bat (*Lasiurus cinereus*)
- Long-eared myotis (*Myotis evotis*)
- Silver-haired bat (*Lasionycteris noctivagans*)
- Big brown bat (*Eptesicus fuscus*)
- Eastern cottontail (*Sylvilagus floaridanus*)
- Townsend's chipmunk (*Tamias townsendii*)
- Eastern gray squirrel (*Sciurus carolinensis*)
- Western gray squirrel (*Sciurus griseus*)
- Douglas' squirrel (*Tamiasciurus douglasii*)
- Northern flying squirrel (*Glaucomys sabrinus*)
- Beaver (*Castor canadensis*)
- Deer mouse (*Peromyscus maniculatus*)
- Black rat (*Rattus rattus*)
- Long-tailed vole (*Microtus longicaudus*)
- Creeping vole (*Microtus oregoni*)
- Townsend's vole (*Microtus townsendii*)
- Muskrat (*Ondatra zibethicus*)
- Porcupine (*Erethizon dorsatum*)
- Coyote (*Canis latrans*)
- Red fox (*Vulpes vulpes*)
- Black bear (*Ursus americanus*)
- Raccoon (*Procyon lotor*)
- Mink (*Mustela vison*)
- Ermine (*Mustela erminea*)
- River otter (*Lutra canadensis*)
- Striped skunk (*Mephitis mephitis*)
- Columbian black-tailed deer (*Odocoileus hemionus columbianus*)

In addition, other mammal species (undocumented but believed to potentially reside) on McChord AFB include Pacific water shrew (*Sorex bendirii*), montane or dusky shrew (*Sorex monticolus*), coast mole (*Scapanus orarius*), Townsend's big-eared bat (*Corynorhinus townsendii*), Keen's myotis (*Myotis keenii*), snowshoe hare (*Lepus americanus*), domestic rabbit (*Oryctolagus cuniculus*), mountain beaver (*Apoldontia rufa*), Mazama pocket gopher (*Thomomys mazama*), bushy-tailed woodrat (*Neotoma cinerea*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), southern red-backed vole (*Clethrionomys gapperi*), Pacific jumping mouse (*Zapus trinotatus*), nutria (*Myocastor coypus*), long-tailed weasel (*Mustela frenata*), western spotted skunk (*Spirogale gracilis*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), and elk (*Cervus elaphus*) (TNC, 2006).

The TNC mammal inventory (2006) included two sampling locations in the vicinity of the proposed action area (RW-2 and AP-2). Of the species listed above, 13 species of mammals were identified at these sites. These included Trowbridge's shrew, Eastern cottontail, Eastern gray squirrel, Douglas' squirrel, northern flying squirrel, deer mouse, long-eared myotis, long-legged myotis, creeping vole, Townsend's vole, porcupine, coyote, and Columbian black-tailed deer.

3.7.3.3 Amphibians

Wetlands and their adjacent uplands are important breeding, resting, and foraging areas for many amphibians and reptiles. TNC and the Washington Natural Heritage Program (Leonard and TNC, 1996) surveyed for amphibians and reptiles on McChord AFB between 1994 and 1995. During the survey, emphasis was placed on McChord AFB's wetlands, ponds, and riparian areas. The results of the survey suggest that the south approach-departure surface south of Perimeter Road (south of the proposed action area) provides the most significant amphibian and reptile habitat on McChord AFB (Leonard and TNC, 1996). In the vicinity of the Draper wetland, within the proposed action area, two species of amphibians and one species of reptile were found. These include:

- Long-toed salamander *(Ambystoma macrodactylum)*
- Pacific tree frog *(Hyla regilla)*
- Common garter snake *(Thamnophis sirtalis)*

3.7.3.4 Butterflies and Moths

Fourteen butterfly species were identified within south approach-departure surface boundaries, and 45 species of moths were collected Base-wide from wetland and oak woodland sites (TNC, 1999). All of the study areas in the south approach-departure zone were located south of Perimeter Road, outside of the proposed action area. One study area was planned at the southwest corner of the runway, near the proposed action area, but was dropped because no butterflies were observed there (TNC, 1999).

3.7.4 Special-Status Species (Federal Concern, Candidate, and Threatened and Endangered Species)

Table 3-3 lists all of the species of plants and animals identified in the south approach-departure surface with federal or state status.

TABLE 3-3
Special-Status Species in South Approach-Departure Surface at McChord AFB
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

Scientific Name	Common Name	Federal Status	State Status	Habitats and Locations
Aster curtus	White-top aster	Species of Concern	Sensitive	South of runway
Eremophila alpestris strigata	Streaked horned lark	Candidate	Endangered	Managed grassland habitats
Butorides virescens[a]	Green heron	None	Monitor	Clover Creek and Morey Creek
Empidonax traillii	Willow flycatcher	Species of Concern	None	Common at McChord AFB in wetland shrub thickets, riparian forests, and oak woodlands
Falco columbarius[a]	Merlin	None	Candidate	Open habitat
Pooecetes gramineus affinis[a]	Oregon vesper sparrow	None	Candidate	Grassland habitats
Dryocopus pileatus	Pileated woodpecker	None	Candidate	Forested areas in south approach-departure surface
Progne subis	Purple martin	None	Candidate	Wetlands in south approach-departure surface and airfield grassland habitat
Chaetura vauxi	Vaux's swift	None	Candidate	Variety of habitats on McChord AFB
Sialia mexicana	Western bluebird	None	Monitor	Open grassland and oak woodland edges
Myotis evotis	Long-eared myotis (bat)	Species of Concern	Monitor	Coniferous forest surrounding Holiday Park
Myotis volans	Long-legged myotis (bat)	Species of Concern	Monitor	Coniferous forest surrounding Holiday Park

[a]Denotes special-status species present at McChord AFB and not specifically identified in the proposed action area (TNC, 1996b).

Source: WDNR, 2006; WDFW, 2007.

Field surveys of McChord AFB conducted by TNC and other biologists have identified four federally listed species of concern present or potentially present within the proposed action area (TNC, 1999; TNC, 1998; TNC, 1996a; TNC, 1996b; TNC, 1996c; Leonard and TNC, 1996; WDNR, 2006). The white-top aster, willow flycatcher, long-eared myotis, and long-legged myotis are further described below. The streaked horned lark (*Eremophila alpestris strigata)* is a federal candidate species and has been identified throughout an area northeast of the airstrip (Pearson, 2003). The proposed action area was not specifically searched for the presence of this species. Because the streaked horned lark is of local interest and is

associated with managed grassland habitats present in the south approach-departure surface, it is included in the following discussion.

The Draper wetland contains indicator species associated with water howellia, which is federally listed as a threatened species, but this species has not been identified there (McChord AFB, 2006a). The wetland is small, with low water quality and abundant algae, and the McChord AFB Howellia Report (TNC, 2005) indicated that howellia was not identified at the Draper wetland. The Howellia Report concluded that the wetland was not sufficiently large to justify continued monitoring for howellia presence.

3.7.4.1 White-top Aster

White-top aster is a federal species of concern and a state sensitive species. It occurs on open to partially wooded prairies with more than 50 percent cover of native species (Thomas and Carey, 1996, as reported in USDOT, FHA, et al., 2003) from southern Vancouver to the Willamette Valley in Oregon. It is threatened primarily by loss of habitat through conversion to other uses, and by invasion of the prairie by Douglas-fir and Scotch broom. White-top aster populations have been identified in the south approach-departure surface boundaries within degraded prairie habitat and/or former oak savanna habitat (WDNR, 2006, and TNC, 1996b). At the south end of the runway, within the proposed action area, one clump of white-top aster (less than one square meter) was identified in 1996. The plants were in a mowed area, and, as a result, were quite stressed (TNC, 1996b). There is no written record of this clump of White-top Aster since 1996. Scotch broom and diffuse knapweed (*Centaurea diffusa*) both were identified nearby.

3.7.4.2 Streaked Horned Lark

The streaked horned lark is a federal candidate species with a breeding range in western Washington that is limited to oak and prairie habitats of south Puget Sound. Typical breeding habitat includes open country with short herbaceous vegetation and areas of exposed soils (USDOT, FHA, et al., 2003). They are thought to avoid areas dominated by shrubs, perennial bunch grasses, rhizomatous grasses, and nonnative perennial forbs (Pearson, 2003). These ground nesting birds are considered neotropical migrants, although their migration pattern is largely unknown. Survey data yield different estimates of streaked horn lark population size. Some studies estimate lark populations at 50 pairs within the Puget Trough and 100 breeding pairs in Washington (TNC, 1998, and Rogers, 1999a, and MacLaren, 2000, as reported in USDOT, FHA, et al., 2003). Pearson (2003) cites studies by Rogers (1999) and Altman (1999) indicating streaked horn lark population sizes in Washington (100 birds) and Oregon (300 birds) but concludes that actual population size for both states could be less than 300 birds.

In 1994 and 1995, up to 13 streaked horned larks were identified adjacent to the McChord AFB in mowed grassland habitat (outside of south approach-departure surface boundaries; TNC, 1996b). Surveys in 1999 and 2000 identified seven and five males, respectively, within the airfield areas (Rogers, 1999a, and MacLaren, 2000, as reported in USDOT, FHA, et al., 2003). A 3-day survey in 2001 investigated suspected lark habitat within the south approach-departure surface and did not identify any larks (USDOT, FHA, et al., 2003). Pearson's (2003) work found use of McChord AFB by streaked horned lark including 14 active nests and 6 nests producing young. Recommendations for

improving alternative nesting sites on McChord AFB include managing grassland habitats in the south approach-departure surface (TNC, 1998).

3.7.4.3 Willow Flycatcher

The willow flycatcher is a federal species of concern. This bird is common throughout McChord AFB and is found in wetland shrub and oak woodland habitats within south approach-departure surface boundaries (TNC, 1996b). The flycatcher appears to prefer open habitats that are dominated by grass and Scotch broom and avoids habitat with dense Douglas-fir trees (TNC, 1998). The flycatcher is susceptible to nest parasitism by the brown cowbird (TNC, 1996b). This species was one of the most frequently observed birds on McChord AFB in surveys conducted in 1993, 1994, and 1995.

3.7.4.4 Long-eared Myotis

The long-eared myotis is a federal species of concern. This bat occurs in humid coastal forests to semi-arid short-grass prairie and roosts in trees, buildings, and caves. It feeds on airborne insects and by gleaning (Washington Gap Analysis Project, 2007). Long-eared myotis is present in the woods surrounding Holiday Park and the eastern edge of the proposed action area (McChord AFB, 2006a; TNC, 2006).

3.7.4.5 Long-legged Myotis

The long-legged myotis is a federal species of concern, occurring primarily in coniferous forests but also found in riparian and arid habitats, possibly shifting habitats seasonally. This bat roosts in abandoned buildings, cracks on the ground, crevices, and spaces beneath tree bark. It feeds primarily on moths (Sevilleta LTER, 2007). A single individual of long-legged myotis was captured in the conifer woods southwest of Holiday Park (TNC, 2006) and, as such, this species may occupy habitat along the eastern edge of the proposed action area.

3.8 Socioeconomics

McChord AFB is located in Pierce County, Washington. In 2000, the estimated population of Pierce County was 700,820 (U.S. Bureau of the Census, 2000). According to the McChord AFB Economic Influence Statement (McChord AFB, 2006b), McChord AFB currently employs more than 10,700 persons, including 4,300 civilians, 4,000 active duty military personnel, and 2,400 Traditional Guardsmen and Reserves. There are approximately 5,900 military dependents living on or near McChord AFB.

McChord AFB has a significant positive socioeconomic impact on the region. The Economic Influence Statement completed in 2006 indicated that the total payroll of McChord AFB exceeded $348,261,600 and had total annual expenditures for materials, equipment, and supplies greater than $58,999,000. McChord AFB created an estimated 4,419 jobs within a 50-mile radius, with an estimated value of $181,061,963.

3.9 Cultural Resources

The Cultural Resources Management Plan (CRMP) (McChord AFB, 2004a) was developed to implement effective management of cultural resources as part of McChord AFB General Plan (Higginbotham Briggs and Associates, 2005). It summarizes the history and pre-history of McChord AFB and reviews past historical and archeological survey efforts. The CRMP outlines and assigns responsibilities for the management of historical and cultural resources and discusses related concerns and standard operating procedures. Procedures that help to preserve McChord AFB cultural resources within the context of the base mission are discussed in the following paragraphs.

CH2M HILL conducted a field reconnaissance in December 2005 to identify homesteads in the proposed action area. None were found to be within the boundary of the proposed action area.

As described in the CRMP, a comprehensive study was conducted to inventory Cold War buildings and structures. A total of 29 buildings and structures were inventoried on McChord AFB. Building 300 (FIS alert hangar) was the only structure at McChord AFB interpreted as potentially eligible for the National Register of Historic Places as a Cold War facility. It has been only slightly altered and is deemed eligible under the NRHP as a rare structure associated with a nearly continuous significant alert mission from the first years of the Cold War to its end, and as one of the first standardized FIS alert hangars erected nationwide and one of the few expanded to a double-squadron capacity. The southeastern corner of Building 300 is within the proposed action area. No trees are present in the vicinity of Building 300 within the proposed action area.

All of the other potentially eligible historic facilities are near to or within the boundaries of the McChord AFB historic district. The facilities in the historic district were submitted in a formal nomination to the NRHP. None of the historic facilities are affected by the tree removal described in this assessment.

3.10 Land Use

McChord AFB occupies 4,639 acres and is divided into the following land use categories (Higginbotham Briggs and Associates, 2005):

- Administrative
- Aircraft operations/maintenance
- Airfield
- Community (commercial)
- Community (service)
- Housing (accompanied)
- Housing (unaccompanied)
- Industrial
- Medical
- Open space
- Outdoor recreation
- Water

The proposed action area lies primarily in an area classified as airfield, with approximately 500 feet along the southern boundary of the proposed action area classified as open space. The on-base area to the northwest of the proposed action area is classified as aircraft operations, and to the east, Holiday Park is classified as outdoor recreation. An industrial area of McChord AFB lies to the west of the proposed action area. The nearest residential area, in the town of Spanaway, lies more than ½-mile east of the proposed action area.

The land uses that surround McChord AFB are residential, commercial, public, recreation/ open space, and water. Residential land uses are located on the northwestern and eastern sides of the installation. There is a large commercial district that that follows Interstate-5 adjacent to the northern side of McChord AFB. This commercial district is largest at the northernmost part of McChord AFB, tapering off near a residential area to the west. There are three other commercial areas near McChord AFB, one to the west, one to the northeast that extends up to the perimeter fence, and a small district to the southeast of the main commercial area.

The area to the south of McChord AFB is the Fort Lewis military training range. There are also several other public land uses nearby. Several recreational/open spaces are near McChord AFB. American Lake, Gravelly Lake, and Steilacoom Lake are located to the west, and Spanaway Lake is located east of McChord AFB.

3.11 Utility Infrastructure

McChord AFB owns and operates its own wells and storage areas for potable water. Wastewater flows to the Fort Lewis wastewater treatment plant to the south of McChord AFB. Electricity and natural gas are the primary sources of energy at McChord AFB. Electrical power is supplied by Tacoma Public Utilities, and natural gas is provided by Washington Natural Gas.

The only known utilities in the proposed action area are two underground electrical lines. One services the runway lighting system, and the other borders Outer Drive and services the east side of McChord AFB (McChord, 2007b).

3.12 Transportation

McChord AFB uses four gates for access to the facility: the main (west) gate (I-5 to Bridgeport Way), the housing gate (I-5 to Woodbrook Drive), the commercial gate (Perimeter Road to Southgate Road), and the South gate (Barnes Blvd and Perimeter Road).

The on-base transportation system consists of arterials, collectors, and local streets. The streets on the south approach-departure surface consist of Outer Drive and Perimeter Road. Perimeter Road is an arterial road forming the southern boundary of the proposed action area. It connects with Barnes Boulevard, a north-south arterial to the west. Barnes Boulevard intersects with Lincoln Boulevard, an east-west arterial. Lincoln Boulevard intersects with Outer Drive, a collector road that runs south and then east-to-northeast through the proposed action area. Outside of the area, Outer Drive heads north. Roadways within the boundary of the proposed action area are shown in Figure 3-1.

3.13 Airspace/Airfield Operations

Aircraft operations at McChord AFB are conducted primarily on Runway 16/34 and the associated taxiways and aircraft parking aprons. The McChord AFB AICUZ Program promotes land use development that is compatible with Base airfield operations (McChord AFB, 1998a). The AICUZ Program identifies three types of airspace constraints: height obstructions to air navigation, noise zones generated from aircraft operations, and accident potential zones.

As discussed in Section 1.4, the Proposed Action includes the Clear Zone. Air Force-wide accident data between 1968 and 1995 indicated that after the runway accident potential, the highest potential for accidents is in airfield clear zones (27 percent over the study period (AFH 32-7084). Nearly all of the remaining area included in the Proposed Action is identified as part of Accident Potential Zone I (APZ I; McChord AFB, 1998a), which has an historical accident rate Air Force-wide of 10 percent.

3.14 Safety and Occupational Health

McChord AFB complies with the Air Force Occupational Safety and Health Standard 91-501. Safety standards specifically applicable to the proposed action area include guidance for safe aircraft operation (UFC 3-260-1 and UFC 3-535-01), as discussed in Section 1.4. Ground safety standards include strict limitations on driving within the confines of the McChord AFB flight line (62d Airlift Wing Instruction 13-4, 10 March 2005) and the installation written hazard communication program (62d AW Instruction 48-3, 15 March 2007).

3.15 Environmental Management

3.15.1 Pollution Prevention

McChord AFB has several environmental management plans designed to minimize the potential for environmental pollution. One document, Ramp Operations Procedures (62AWI21-03, 19 August 2004) (McChord AFB, 2004b), focuses on the vicinity of the proposed action area, including the airfield, and describes procedures designed to eliminate or reduce the environmental impact of airfield operations. McChord AFB *Stormwater Pollution Prevention Plan* (May 2003) (McChord AFB, 2003b) provides management practices and guidance for activities associated with stormwater discharges from McChord AFB.

3.15.2 Installation Restoration Program

According to McChord AFB General Plan (2003), the McChord AFB IRP began in 1982. All of the 65 potentially contaminated areas identified as part of the program either have remediation underway or have been found to require no further action. Two of the sites were designated National Priorities List (NPL) sites. These are the American Lake Garden Tract (ALGT) and the NPL-delisted Washrack/Treatment Area. A pump and treat system is in operation at the ALGT site, and natural biodegradation of petroleum products at the Washrack/Treatment Area is occurring. Investigations for all 29 IRP sites at McChord AFB

that were under state oversight have been completed, and the sites have been placed in a long-term monitoring program.

None of the IRP sites are located within or adjacent to the proposed action area.

3.16 Environmental Justice and Protection of Children

On February 11, 1994, the President issued EO 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. The purpose of this EO is to avoid disproportionate placement of any adverse environmental, economic, social, or health impacts from federal actions and policies on minority and low-income populations. On 21 April 1997, the President issued EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, which recognized that a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health and safety risks. This EO required federal agencies to identify and assess such environmental health and safety risks. EO 13045 does not provide guidance on the ages of the children to be protected. However, the Federal Interagency Forum on Child and Family Statistics (FIFCFS), which was founded in 1994 and formally established by the EO, focuses on those aged 17 and under (FIFCFS, 2006).

Table 3-4 presents year 2000 race, ethnicity, and poverty demographics for the census tracts (CTs) that include and are in the immediate vicinity of the area of the Proposed Action. As indicated in Table 3-4, the largest minority population in CT 729.01, which covers the entire Base property, is African American (6.69 percent). CT 720 (town of Lakewood), located just outside the western Base boundary, has the highest minority population in the area, primarily African Americans (16.68 percent).

TABLE 3-4
Race, Ethnicity, and Poverty Demographics by Percentage of Population
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

	CT 714.03 Spanaway	CT 715.03 Parkland	CT 715.04 Parkland	CT 720 Lakewood	CT 729.01 McChord AFB	Pierce County
Total Population	**3,821 (%)**	**4,857 (%)**	**5,306 (%)**	**4,865 (%)**	**4,168 (%)**	**700,820 (%)**
White alone	74.74	74.43	82.45	62.61	77.04	78.33
Black or African American alone	6.99	6.28	4.15	16.81	6.69	6.95
American Indian and Alaska Native alone	0.99	0.95	0.90	1.27	1.63	1.35
Asian alone	5.86	7.58	2.73	4.83	4.39	4.95
Native Hawaiian and Other Pacific Islander alone	2.30	0.31	2.85	0.92	0.26	0.72
Some other race alone	1.83	2.39	2.36	3.21	1.49	2.12
Two or more races	7.28	8.07	4.56	10.34	8.49	5.57
Hispanic or Latino	4.71	5.81	4.49	11.49	8.09	5.50
Poverty Status	14.58	16.33	21.77	37.04	7.30	10.49
Children Under 17	24.29	24.89	16.11	31.65	35.58	27.15

The U.S. Bureau of the Census bases the poverty status of families and individuals on 48 threshold variables, including income, family size, number of family members under the

age of 18 and over 65 years of age, and amount spent on food. Table 3-4 summarizes the poverty status of the CTs that include and are in the immediate vicinity of the proposed action area. As indicated in Table 3-4, more than 20 percent of the residents in CT 715.04 (Parkland) and CT 720 (Lakewood) have incomes below the poverty threshold. As such, these areas are classified as a "poverty area."

In 2000, the U.S. Bureau of the Census estimated that 25.7 percent of Washington's population and 27.2 percent of Pierce County's population were children under 18 years of age. CT 729.01, which covers the entire McChord AFB property, has the highest percentage of children under 18 years of age in the vicinity of the Proposed Action (35.58 percent), due primarily to the presence of military family housing on Base. Outside of McChord AFB, CT 720 (31.65 percent) has the highest percentages of children under 18 years of age in the vicinity of the Proposed Action.

SECTION 4.0

Environmental Consequences

4.1 Introduction

This section presents an evaluation of the potential physical, biological, cultural, and socioeconomic consequences associated with the Proposed Action, the alternative actions, and the No Action Alternative. The potential impacts were evaluated for the elements of the existing human and natural environment described in Section 3. For each environmental resource or issue, anticipated direct and indirect impacts were assessed, considering both short-term and long-term impacts. This section also addresses potential indirect and cumulative impacts, unavoidable adverse impacts, the relationship between short-term uses and enhancement of long-term productivity, irreversible and irretrievable commitment of resources, and coastal zone management.

For evaluation purposes, the Proposed Action and the alternative actions were assumed to be conducted using a small operator with a 2-cycle chainsaw and a self-loading truck (AFCEE, 2007). Because the soil is susceptible to rutting, no skidder or tractor would be used. The operation is estimated to take approximately 6 months (AFCEE, 2007). Tree trunks and large branches (greater than 6 inches in diameter) would be removed from the site for use as firewood, but tree canopies (slash) would be left onsite (McChord AFB, 2007c).

4.2 Air Quality

4.2.1 Proposed Action

4.2.1.1 Compliance with National Ambient Air Quality Standards

The Proposed Action would result in short-term, temporary impacts on air quality. Vehicle and equipment exhaust emissions would be generated during tree removal. Minimal fugitive dust would be generated by vehicles and equipment because the ground surface consists primarily of gravel and cobbles.

Pollutants that would be emitted from the internal combustion engine exhaust of vehicles and equipment include nitrogen oxides (NO_x), CO, $PM_{2.5}$, PM_{10}, and volatile organic compounds (VOCs). These types of exhaust emissions would be temporary, and the estimated emissions generated by the action are not expected to significantly affect air quality.

Emissions were calculated for Alternative 1 (see Section 4.2.2) because clear cutting the entire proposed action areas would result in the greatest potential emissions. The pollutants emitted as a result of the Proposed Action, involving selective clear cutting, would be less than those with implementation of Alternative 1. In general, air emissions would increase above baseline conditions under the Proposed Action; however, the resulting air quality impacts are expected to be temporary.

4.2.1.2 General Conformity Requirements

The CAA established programs and permitting processes designed to protect and improve air quality. Section 176(c) of the CAA Amendment of 1990, 42 U.S. Code Section 7506(c), establishes conformity requirements for federal agencies and has been implemented by 40 CFR 93 Subpart B. Conformity requirements apply to federal actions proposed in areas designated as non-attainment or maintenance.

The Proposed Action would be located in Pierce County, which is a maintenance area for CO. Thus, in this area CO emissions are subject to general conformity requirements. In accordance with the air conformity requirements of 40 CFR Sections 51.853 and 93.153(b)(1), the de minimis threshold set for carbon monoxide maintenance areas is 100 tons of CO per year. Emissions of CO resulting from vehicle exhaust and equipment emissions during tree removal activities under Alternative 1 are far below the de minimis thresholds and emissions associated with implementation of the Proposed Action would be less than those estimated for Alternative 1.

When the total emissions of the maintenance pollutants do not exceed the de minimis limit, no further conformity analysis is needed. Consequently, no further general conformity analysis is required for the Proposed Action.

4.2.2 Alternative 1: Clear Cutting

Under Alternative 1, the air quality impacts are expected to be slightly higher than estimated for the Proposed Action. The equipment usage and time required to complete the tree removal are expected to be slightly higher than for the Proposed Action because more trees will be removed. The estimated annual emission increases associated with Alternative 1 are given in Table 4-1. Emissions of CO resulting from vehicle exhaust and equipment emissions during tree removal are far below the de minimis thresholds. In general, air emissions would increase above baseline conditions under Alternative 1; however, the resulting air quality impacts are expected to be temporary. Supporting documentation and emissions estimates are given in Appendix C.

TABLE 4-1
Pollutant Emission Estimates for Proposed Action
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

Pollutant	Proposed Action Annual Emissions (tpy)	Proposed Action Annual Emissions (lb/yr)	Emissions Threshold[a] (tpy)	Above/ Below Emissions Threshold for Significance
CO	1.51	3029.85	100	Below
VOC	0.29	578.99	40	Below
NO_X	0.08	169.45	40	Below
Sulfur Oxides	0.00	1.19	40	Below
PM_{10}	0.04	87.05	15	Below
$PM_{2.5}$	0.04	80.11	NA	Below

[a] Source: Washington Administrative Code (WAC)173-400-030.

Notes:

Emissions calculations shown in Appendix C.

lb/yr = pounds per year
NA = not applicable
tpy = tons per year

As indicated in Table 4-1, emissions from the proposed tree removal activities, to the extent quantifiable, would not have a significant impact on air quality. The significance thresholds from WAC 173-401 are shown in the table for reference; however, because the tree removal emissions are not classified as a stationary source, these limits do not apply. McChord AFB is not authorized to emit more than 99 tons of sulfur dioxide, NO_x, or CO each during any 12 consecutive month period because of McChord AFB's synthetic minor limits.

4.2.3 Alternative 2: Removal of Individual Trees

Under Alternative 2, the air quality impacts are expected to be the same or slightly less than estimated for the Proposed Action. A similar number and types of equipment and a similar number of personnel would need to be onsite for this alternative. The emissions would be expected to be lower for the chain saw, but the truck emissions would be roughly the same or greater because of the extra maneuvering that would be required. In general, air emissions would increase above baseline conditions under the Alternative 2; however, the resulting air quality impacts are expected to be temporary and equal to or slightly less than expected for the Proposed Action.

4.2.4 No Action Alternative

Under the No Action Alternative, no tree removal activities would be conducted; therefore, no change in air quality would occur.

4.3 Noise

4.3.1 Proposed Action

As shown in Table 4-2, typical construction work generates noise levels in the range of 84 to 89 dBA. According to the EPA publication *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances* (EPA, 1971), noise levels at 50 feet from a source decrease by approximately 3.0 dBA over a hard, unobstructed surface, such as asphalt, and by approximately 4.5 dBA over a soft surface, such as vegetation. The maximum acceptable noise level for most residential land uses is generally considered to be 65 dBA DNL. The nearest residential area to the site is approximately one-third of a mile away. Impacts would be correspondingly slight.

Under the Proposed Action, ambient noise levels at and around the logging area would temporarily increase. The increased noise levels would be short term (less than 6 months). Although noise generated by activities conducted during the daytime are exempt from the WAC, the anticipated levels presented in Table 4-2 are generally below the daytime residential limits. Given the temporary nature of the activities, the elevated ambient noise conditions because of proximity to the flight line, and the proposed action area's distance (approximately 1,800 feet) from the nearest residential area, no significant adverse impacts are anticipated from the noise emissions.

TABLE 4-2
Noise Levels from Common Construction Equipment at Various Distances
Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

Construction Equipment	Typical Sound Pressure Level (dBA) at 50 feet	Expected Sound Pressure Level (dBA) at:		
		1,000 feet	2,500 feet	5,000 feet
Bulldozer (250 to 700 horsepower)	88	62	54	43
Front-end loader (6 to 15 cubic yards)	88	62	54	43
Truck (200 to 400 horsepower)	86	60	52	41
Grader (13- to 16-foot blade)	85	59	51	40
Shovel (2 to 5 cubic yards)	84	58	50	39
Portable generators (50 to 200 kilowatts)	84	58	50	39
Mobile crane (11 to 20 tons)	83	57	49	38
Concrete pumps (30 to 150 cubic yards)	81	55	47	36
Tractor (3/4 to 2 cubic yards)	80	54	46	35

4.3.2 Alternative 1: Clear Cutting

Under Alternative 1, noise emissions would be similar to those of the Proposed Action but the timetable would probably be longer (approximately 6 months) because all trees would need to be removed from the site. Given the temporary nature of the activities, the elevated ambient noise conditions because of proximity to the flight line, and the proposed action area's distance (approximately 1,800 feet) from the nearest residential area, no significant adverse impacts are anticipated from the Alternative 1 noise emissions.

4.3.3 Alternative 2: Removal of Individual Trees

Under Alternative 2, the maximum noise levels from the equipment would be the same as the levels anticipated for the Proposed Action. The use of a chain saw at the site would probably be less because fewer trees would need to be removed from the site. The use of the self-loading truck would probably be the same as for the Proposed Action because the truck would have to be maneuvered around the trees to be left in place. Given the temporary nature of the activities, the elevated ambient noise conditions because of proximity to the flight line, and the proposed action area's distance (approximately 1,800 feet) from the nearest residential area, no significant adverse impacts are anticipated from the Alternative 2 noise emissions.

4.3.4 No Action Alternative

Under the No Action Alternative, no tree removal activities would occur; therefore, no change in the existing noise environment would result.

4.4 Wastes, Hazardous Materials, and Stored Fuels

4.4.1 Proposed Action

The south approach-departure surface north of Perimeter Road is undeveloped and does not include facilities that generate waste, use hazardous materials, or store or use fuels. Under the Proposed Action, hazardous materials such as oil and fuels would be used in logging equipment. Trees in the Draper wetland would be topped rather than removed altogether which requires smaller equipment (e.g., the self-loading truck would not be required to remove trees from the wetland) than felling and, therefore, activities in this area would be less likely to cause accidental spills.

However, whenever oil and fuels are used, there is the potential for accidental spills caused by equipment malfunction or during refueling operations. The potential for accidental spills and associated potential impacts would be minimized through the use of best management practices (BMPs) such as proper maintenance of equipment and use of a funnel or flexible nozzle for refueling. After the logging is complete, the area would remain undeveloped and would not be used for storage of hazardous materials, nor would any activities be conducted requiring the use of hazardous materials.

If contaminated materials were encountered during logging, such as abandoned drums or oily materials on the ground, McChord AFB Environmental Management Flight (CEV) would be notified immediately and remedial measures would be implemented as directed by CEV.

Under the Proposed Action, the impacts on human health and the environment from use of oil and fuels and from disturbance of potentially existing contamination would be less than significant because BMPs and contingency measures would be implemented in case of inadvertent discovery of hazardous waste.

4.4.2 Alternative 1: Clear Cutting

With respect to wastes, hazardous materials, and stored fuels, Alternative 1 is similar to the Proposed Action except that trees in the Draper wetland would be clear cut rather than removed altogether. Clear cutting would require larger equipment (e.g., in the Draper wetland where trees would be removed and therefore would require the use of the self-loading truck), and activities in this area would be more likely to cause accidental spills.

Under Alternative 1, the impacts on human health and the environment from use of oil and fuels and from disturbance of potentially existing contamination would be less than significant because BMPs and contingency measures would be implemented in case of inadvertent discovery of hazardous waste.

4.4.3 Alternative 2: Removal of Individual Trees

With respect to wastes, hazardous materials, and stored fuels, Alternative 2 is similar to the Proposed Action.

Under Alternative 2, the impacts on human health and the environment from use of oil and fuels and from disturbance of potentially existing contamination would be less than

significant because BMPs and contingency measures would be implemented in case of inadvertent discovery of hazardous waste.

4.4.4 No Action Alternative

Under the No Action Alternative, the use of hazardous materials and the generation of hazardous waste would not change and, therefore, no impacts on human health or the environment would occur.

4.5 Topography and Soils

4.5.1 Proposed Action

The Proposed Action would have minor, temporary impacts on topography and soils during the movement of logging equipment and the dragging of cut logs over the surface. Movement of heavy logging equipment and dragging of cut logs could create ruts in soil. Existing roadways could be used to access trees in the western portion of the site, and trees in the central and eastern portions of the site can be accessed by four-wheel drive vehicle driving over the surface. No new roadways would need to be constructed.

Slash would be left in place to help control erosion that could result from damage to soils, particularly in steeply sloped areas. The terrain is fairly level in areas outside the wetland, which would limit the velocity of any runoff, and soils are well drained so that runoff would be limited further. Because trees in the Draper wetland would not be removed but would instead be topped consistent with current practice, there would be no new impact on erosion processes in the wetland.

Implementation of Proposed Action would have a lesser impact on topography and soils than Alternative 1, because trees in the Draper wetland would not be felled in their entirety.

4.5.2 Alternative 1: Clear Cutting

Similar to the Proposed Action, Alternative 1 would potentially have minor, temporary impacts on topography and soils during the movement of logging equipment and the dragging of cut logs over the surface. Removal of trees in the Draper wetland area could potentially result in minor erosion along the steeply sloped sides of the wetland where surface runoff velocities could be higher if vegetation is not present to slow surface flow and enhance infiltration. Other vegetation (shrubs and grasses) present on the slopes of the wetland would hold the soil in place and thus reduce the erosion potential.

Implementation of the Proposed Action is not expected to significantly affect topography or soils because of the generally flat surface, slash left in place to control runoff and subsequent erosion, and presence of well-drained soils that further reduce runoff.

4.5.3 Alternative 2: Removal of Individual Trees

Similar to the Proposed Action, Alternative 2 would have minor, temporary impacts on topography and soils during the movement of logging equipment and the dragging of cut

logs over the surface. Trees in the Draper wetland would not be removed but would instead be topped consistent with current practice, there would be no new impact on erosion processes in the wetland. Implementation of Alternative 2 would have a lesser impact on topography and soils than the Proposed Action because removal of individual trees would result in less disturbance of soils from logging equipment.

4.5.4 No Action Alternative

Under the No Action Alternative, potential impacts on topography and soils would not change.

4.6 Water Resources

The CWA is the primary federal law that protects the waters of the United States. Since the CWA was enacted in 1972, additional regulations have been enacted to meet its objective of maintaining and restoring the integrity of water bodies.

All federal agencies are required to provide leadership and take action to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values of floodplains when acquiring, managing, or disposing of federal lands.

Impacts on water resources could potentially be significant if implementation of the Proposed Action or alternatives would result in changes in water quality or supply, threaten or damage unique hydrologic characteristics, endanger public health by creating or worsening health hazards, or violate established laws or regulations. Impacts of flood hazards on proposed actions would be significant if such actions were proposed in areas with high probabilities of flooding.

4.6.1 Proposed Action

4.6.1.1 Surface Waters

No surface water impacts are anticipated as a result of the Proposed Action because no surface water resources are present within the proposed action area of McChord AFB. Potential impacts on wetlands are described in Section 4.7.

4.6.1.2 Groundwater

The Proposed Action would selectively remove woody vegetation from the 50:1 imaginary surface and light plane. Contaminated materials are not anticipated to be present in the proposed action area, and petroleum compounds (e.g., oil, diesel, gasoline) used in conjunction with the tree removal action would be managed in accordance with BMPs in order to minimize the potential for any release (see Section 4.4). Therefore, contamination would not be released to groundwater as a result of the Proposed Action.

In addition, the Proposed Action would not include increases in impervious surfaces or discharges of pollutants. Limited, localized soil compaction may result from timber removal

machinery, but the compaction would not have widespread impacts on surface water runoff or groundwater infiltration, and, therefore, would not cause a significant impact.

No significant impacts on groundwater are anticipated as a result of the Proposed Action.

4.6.1.3 Floodplains

Because the proposed action area is not within a floodplain, implementation of the Proposed Action would have no floodplain impacts.

4.6.2 Alternative 1: Clear Cutting

4.6.2.1 Surface Water

No surface water impacts are anticipated as a result of Alternative 1 because no surface water resources are present within the proposed action area.

4.6.2.2 Groundwater

Potential groundwater impacts under Alternative 1 would be similar to those described for the Proposed Action. No significant impacts on groundwater are anticipated as a result of implementing Alternative 1.

4.6.2.3 Floodplains

Because the proposed action area is not located in or near a floodplain, Alternative 1 would have no impacts on a floodplain.

4.6.3 Alternative 2: Removal of Individual Trees

4.6.3.1 Surface Waters

Because the proposed action area of McChord AFB does not contain surface water resources, Alternative 2 would have no impacts on surface water resources.

4.6.3.2 Groundwater

Groundwater impacts under Alternative 2 would be similar to those described for the Proposed Action. No significant impacts on groundwater are anticipated as a result of the implementing Alternative 2.

4.6.3.3 Floodplains

Because the Proposed Action is proposed to occur in an area of McChord AFB that is not within a floodplain, Alternative 2 would have no floodplain impacts.

4.6.4 No Action Alternative

The No Action Alternative would have no impact on the quality of McChord AFB groundwater or surface water. In addition, no impacts would be expected on floodplains.

4.7 Biological Resources

This section analyzes the potential for impacts on biological resources, such as habitat loss, from implementation of the Proposed Action and the alternatives. Laws and regulations pertaining to affected resources also are discussed in this section. Impacts on biological resources from the Proposed Action and alternatives would be considered significant if special-status species or their habitats are adversely affected or if disturbances and the impacts could cause reductions in population size or distribution of a special-status species. In general, mitigation measures are developed and implemented to reduce impacts to a less than significant level. These determinations are made with reference to federal requirements or thresholds relevant to the species and habitats discussed in Section 3.7.

4.7.1 Proposed Action

4.7.1.1 Vegetation

Regulatory Background. Upland vegetation or habitats that are associated with listed threatened or endangered species are protected under the ESA and are reviewed and regulated by the USFWS. Upland habitats not associated with listed threatened or endangered species are not specifically regulated by any federal agency.

No federally listed threatened or endangered species or priority habitats have been observed in the proposed action area.

Alteration to upland vegetation on federal property is not specifically regulated by local or state agencies. On non-federal properties, vegetation that meets criteria as a priority habitat is regulated by WDFW and WDNR or through habitat management plans on a local level. WDNR regulates forest protection at the state level through the Washington Forest Practices Act (RCW 76.09). This act would require issuance of a permit if trees were logged for use as forest products (for example, paper, pulp, or plywood) but this requirement does not apply to U.S. government agencies.

Noxious weeds and their spread are regulated by Washington State Weed Laws on *nonfederal* lands. However, McChord AFB is currently managing Scotch broom and spotted knapweed (*Centaurea maculosa*) in coordination with Pierce County and TNC. Scotch broom is a state- and county-listed Class B Noxious Weed whose control is recommended in Pierce County. Spotted knapweed is also a state- and county-listed Class B Designated Noxious weed whose control is mandatory in Pierce County. Prevention and control of noxious weeds is an important component in maintaining native vegetation communities such as prairie or oak woodland ecosystems but such requirement does not apply to U.S. government agencies.

Impacts. The Proposed Action would affect existing vegetation communities within the proposed action area.

Trees growing in the proposed action area with a maximum growth potential that exceeds the maximum allowable tree height under the 50:1 imaginary surface, Clear Zone, Clear Zone (Graded Area), and Light Plane criteria (Figure 4-1) would be cut under the Proposed Action. However, trees located in the Draper wetland would only be topped (following current management practices within the Clear Zone) rather than clear cut.

Stands of Garry oak may be selectively removed as a result of the Proposed Action. One stand of Garry oak west of the Draper wetland was identified by TNC as a priority for management due to the stand structure and composition (TNC, 1996). Secondary adverse impacts on vegetation include selective cutting of mature ponderosa pine individuals and loss of habitat structure. Possible indirect impacts resulting from implementing the Proposed Action include the establishment and/or spread of existing noxious weeds (e.g., Scotch broom) into areas previously protected from their invasion by the presence of mature trees. A potentially beneficial impact of implementing the Proposed Action would be the selective felling of Douglas-fir, which is an invasive species in this area. However, felling of Douglas-fir could allow increased establishment of other invasive species such as Scotch broom without additional post-harvest management inputs.

Current forested conditions, especially in Douglas-fir dominated communities, suppress establishment of many weed species through shading. Selective cutting of these forested communities would expose previously protected areas to higher sunlight and potentially increase infestation by invasive species. Noxious weeds can degrade vegetation communities through several vectors including decreasing native species richness, increasing erosion, and reducing native plant cover. These changes in vegetation composition have impacts on habitat-dependent wildlife that require specific habitat features and plant species for breeding, resting, feeding, and/or travel. Noxious weed control efforts (e.g., mowing of Scotch broom) are practiced at McChord AFB and likely would expand to include the new area as funding allows.

4.7.1.2 Wetlands

Regulatory Background. Depositing fill or altering jurisdictional wetlands located on federal lands must be permitted through the USACE nationwide permit program or individual permits under Section 404 of the CWA. However, the wetlands in the area of the Proposed Action are not believed to be jurisdictional wetlands since they are hydrologically isolated (see below). In addition, wetlands located on federal lands are protected through EO 11990. EO 11990 requires federal agencies to "minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands." If avoidance and minimization of impacts is not sufficient, replacement of affected jurisdictional wetland areas may be required. While on-going silvicultural activities are exempt from Section 404 oversight, because the forest resources here are being managed to comply with Federal law (FAA regulations and DoD/Air Force regulatory standards) in order to protect public safety, this wetland would be exempt from USACE regulation even if it were characterized as a jurisdictional wetland. Therefore, the impacts would be less than significant.

Under local regulations (Pierce County Code Title 18E.30.060), wetlands classified in Category I or II require 100- to 150-foot buffers. Wetland buffers are considered sensitive environments as well and are regulated as such by local jurisdictions. State and local regulations do not apply on federal facilities, but McChord AFB strives to meet the substantive requirements of this regulation when possible. Currently, the buffer around the Draper wetland meets or exceeds local buffer requirements.

Examination by McChord AFB staff indicates that the Draper wetland has no surface water connections to its surroundings and, as such, is hydrologically isolated

(McChord AFB, 2007a). Therefore, the USACE is not likely to take jurisdiction of this resource.

Impact. The Draper wetland and associated buffer for this wetland kettle hole contain trees that have the potential to exceed the Clear Zone maximum permissible tree height. Under the Proposed Action, within the wetland kettle hole, trees would continue to be topped, rather than felled, in accordance with current practices. Topping trees would allow some tree canopy to remain in the Draper wetland. Impacts on the Draper wetland under the Proposed Action would not change from current conditions.

4.7.1.3 Wildlife

Regulatory Background. Impacts on non-ESA wildlife or their habitat are not regulated on a federal level (with the exception of migratory birds) and are discussed in the following subsection. MBTA prohibits the take of any migratory birds and their active nests containing eggs or young unless otherwise permitted to do so. A depredation permit from the USFWS would be required for any action resulting in the destruction of nesting birds, eggs, or their young. Regulatory implications for ESA wildlife are discussed in Section 4.1.7.4. McChord AFB already has a depredation permit for migratory birds, but it only covers a few possibly occurring species.

Impacts. The Proposed Action would selectively cut native Garry oak and ponderosa pine habitats and associated wildlife habitat, resulting in impacts on wildlife that depend on the existing habitat for all or a portion of their life cycles. The Proposed Action would also selectively remove habitat provided by Douglas-fir, which is an invasive species in this area but provides habitat for a variety of wildlife species. Impacts from the Proposed Action may result in the establishment and spread of noxious weeds into areas of wildlife habitat previously protected from their invasion (see Section 4.7.1.1). These impacts are expected to result in a reduction in the existing wildlife population or distribution of wildlife species dependent upon forested cover for portions of their life cycles. Affected species are expected to include Douglas' squirrel, northern flying squirrel, Eastern gray squirrel, porcupine, long-eared myotis, and long-legged myotis. Ground-dwelling mammals (e.g., shrews, voles, deer mice) are not likely to be affected by the Proposed Action. Coyote and Columbian black-tailed deer, owing to their larger home ranges, are also not likely to be affected. Habitat for Eastern cottontail is likely to increase as a result of the action with potential increases in rabbit populations. Coyote populations could be positively affected by the Proposed Action as a result of potential increases in Eastern cottontail populations.

Many neotropical migratory bird populations use trees for nesting and breeding, and reduction in forest cover in the project area would reduce the amount of habitat available to them. Tree removal during the nesting season could result in impacts on migratory bird species. Under the Proposed Action, impacts on migratory birds would not be significant with implementation of the following measures:

- Avoid tree cutting and removal during the nesting season (April through July).
- If active nests are found, work will not proceed until the eggs have hatched and the young have fledged. If removal of an active nest is necessary, a depredation permit from the USFWS will be required.

Impacts on wildlife resulting from implementation of the Proposed Action would be less than those with Alternative 1 (see Section 4.7.2.3). The habitat of wildlife using the Draper wetland, including amphibian and reptile species, would be less affected than described for Alternative 1, because trees would be topped rather than felled in their entirety and habitat would be maintained. No adverse effects on the population or distribution of a species would occur, and no mitigation is required.

4.7.1.4 Special-Status Plant and Wildlife Species

Regulatory Background. Federal status requirements for discussion under the ESA are as follows:

- Federally listed threatened and endangered species require special evaluation under the ESA (most often addressed through a Biological Assessment).
- Federal candidate species and species of concern do not require special evaluation under the ESA; however, if candidate species become listed during the environmental review process, impacts to these species must be addressed.

Impacts on state-listed species are reviewed to determine whether an impact would adversely affect the continued existence of a population or result in the direct removal of an individual or a population of a species. Federal landowners, although not regulated on a state level, often implement the substantive requirements of the state's ESA protection measures to reduce impacts to a less than significant level.

Impacts. Selective cutting activities associated with the Proposed Action would likely affect special-status species within the proposed action area. Some species would be adversely affected through felling of existing forested communities, while for others there would be beneficial effects because of habitat enhancement through expansion of open grassland and shrub communities. These impacts are associated with conversion of some of the vegetation structure from a forested to shrub community, potential increases in percent cover of invasive species, and displacement of native grasses and forb species. Anticipated impacts of the Proposed Action on special-status species are discussed in the following paragraphs.

White-top Aster. White-top aster is associated with open to partially forested prairies dominated by native grasses and forbs. These populations are sensitive to competition from exotic species and may decline as a result of Scotch broom infestations. Without post-harvest management, open areas resulting from clear cutting would likely increase Scotch broom density and percent cover. However, the white-top aster stand observed in the proposed action area is already stressed due to mowing (TNC, 1996a). Because no trees are currently present in this area, no logging activities would be conducted near the white-top aster population, and impacts on white-top aster due to implementation of the Proposed Action would be less than significant.

Streaked Horned Lark. Typical breeding habitat for the streaked horned lark includes short herbaceous vegetation and areas of exposed soils (USDOT, FHA, et al., 2003). This species of lark is thought to avoid areas dominated by shrubs, perennial bunch grasses, rhizomatous grasses, and nonnative perennial forbs (Pearson, 2003). Streaked horned larks have been identified within the proposed action area (McChord AFB, 2007a). The Proposed Action is

not anticipated to significantly affect lark populations or habitat because trees are not the preferred habitat of this species. No impacts on this species are anticipated.

Willow Flycatcher. The preferred habitat of the willow flycatcher includes wetland shrubs and oak woodland habitats (TNC, 1996b). The flycatcher appears to prefer open habitats that are dominated by grass and Scotch broom and avoids habitat with dense Douglas-fir trees (TNC, 1998). Under the Proposed Action, oak woodland habitats would be selectively cut and, as such, the Proposed Action would reduce available woodland habitat for the willow flycatcher. Because this species is not federally listed as threatened or endangered, no mitigation is required.

Long-Eared Myotis and Long-Legged Myotis. These bat species were reported to be present in woods surrounding Holiday Park (McChord AFB, 2006). Potential roosting sites are present in the eastern boundary of the proposed action area and both species have been observed (heard or captured) in the woods southwest of Holiday Park, in the southeastern portion of the proposed action area. Implementation of the Proposed Action could slightly reduce available habitat for both species. However, the affected area is very small compared to the currently available habitat, and therefore bat populations and distribution at McChord AFB are unlikely to be adversely affected by the Proposed Action. Because these species are not federally listed threatened or endangered species, no mitigation is required.

Other Special-Status Wildlife. Other special-status species present in the proposed action area include merlin, Oregon vesper sparrow, pileated woodpecker, purple martin, Vaux's swift, and western bluebird (see Table 3-3). Merlin and Oregon vesper sparrow prefer open or grassland habitats, which could be enhanced by implementation of the Proposed Action along with additional management of grassland in the area. Habitat for pileated woodpecker, purple martin, and Vaux's swift would be reduced by implementation of the Proposed Action. Western bluebirds have been observed in nesting boxes within the proposed action area, but not in existing natural cavities. Impacts on all of these special-status species would be less than significant, and no mitigation is required.

No mitigation is required under the ESA because the Proposed Action would not affect the continued existence of a federally listed species (threatened, endangered, or candidate) on either a population or an individual level.

Local and state mitigation requirements for impacts on state special-status species are not applicable on federal lands. However, federal landowners often implement the substantive requirements of the state's requirements for protection of plants and wildlife.

4.7.2 Alternative 1: Clear Cutting

4.7.2.1 Vegetation

The most ecologically significant impact resulting from the Alternative 1 would be the elimination of Garry oak priority habitats and associated dependent wildlife because the proposed action area would be clear cut as opposed to selective cutting under the Proposed Action. Alternative 1 would result in similar impacts on vegetation as the Proposed Action.

4.7.2.2 Wetlands

The acre Draper wetland would be directly affected by Alternative 1 (clear cutting) as a result of removal of woody vegetation within the wetland as well as within the wetland buffer. These impacts include loss of wetland and buffer vegetation, reduction or elimination of existing wetland and buffer habitat function, and moderate reduction of water quality functions for the Draper wetland. Because there are only a few trees within the existing buffer around the Draper wetland, the Proposed Action would have limited impact on buffer functions. Under the Alternative 1, clear cutting all trees within the Draper wetland and its buffer would modify the structure of this plant community by removing tree canopies and increasing the amount of solar radiation hitting the soil. In addition to the obvious effects of higher light levels, canopy removal will also result in higher soil and water temperatures. Removal of tree canopies can result in at least temporary increases in water table height and duration of flooding within certain types of forested sites. This phenomenon occurs as a result of the removal of the transpirational pump from the system (resulting from the loss of leaf area associated with tree canopies).

Changes associated with Alternative 1 may affect the remaining wetland in various ways. Within the wetland itself, effects could vary from loss of the understory shrubs and herbs in favor of more sunlight-competitive species such as reed canarygrass (*Phalaris arundinacea*) and cattail (*Typha* spp.), to site closure by shrub species with loss of herbaceous plants, to little or no impact on the understory. Higher water tables extending into the growing season could result in a shift of species composition from the current forested wetland condition to a scrub-shrub or emergent plant community types or, depending upon the seasonality and duration of higher water tables, even open water. Whether this latter condition could result in an increase in waterfowl use of the Draper wetland (owing to the presence of an open water body and its better visibility by waterfowl from the air) is at best difficult to predict but nonetheless possible. If so, additional measures may need to be taken in the future to reduce the probability of bird strikes by aircraft.

Impacts on the wetland would at a minimum result in a change in community composition of the Draper wetland with consequent changes to wetland function as described herein. In accordance with EO 11990, McChord AFB would minimize wetland impacts if Alternative 1 were implemented. Although Alternative 1 would remove trees, it represents minimization of impact in comparison to complete loss of the wetland environment through filling.

Although it is anticipated that the USACE will not claim jurisdiction over the Draper wetland, impacts associated with Alternative 1 would require a finding of no practicable alternative in accordance with EO 11990 and Air Force policy.

4.7.2.3 Wildlife

Removal of the tree canopy and changes in the understory of the Draper wetland under Alternative 1 could affect common amphibian and reptile species identified in that area. Whether the overall effect is negative or not is difficult to ascertain. Loss of the canopy may temporarily increase exposure of these species to predators (from creation of a new access route to the habitat). This impact will be at least partially offset by leaving logging slash in place within the wetland and its eastern buffer (to allow migration to adjoining forest land). The open space created by the loss of canopy could also adversely affect portions of their life cycles that depend upon the thermal protection of the canopy and physical protection

(cover) of the existing understory plant communities. Conversely, higher temperatures and water levels from loss of the tree canopy could enhance amphibian reproduction resulting from higher water temperatures and increases in thin-stemmed herbaceous vegetation to which frogs and other amphibians attach their eggs (King County Department of Natural Resources, 2005).

Impacts on wildlife resulting from implementation of Alternative 1 would be similar to those with the Proposed Action. However, habitat of wildlife using the Draper wetland, including amphibian and reptile species, would be subject to an increased adverse effect than described for the Proposed Action because trees would be felled in their entirety rather than selectively cut.

4.7.2.4 Special-status Plant and Wildlife Species

Impacts on special-status species as a result of implementing Alternative 1 would be similar to those with the Proposed Action. White-top aster would not be affected as a result of implementation of Alternative 1. Streaked horned lark habitat would not be adversely affected, and the action could increase available habitat for the species. Potential habitat for long-legged myotis and long-eared myotis would be slightly reduced by implementing Alternative 1.

Because trees in the proposed action area would be felled in their entirety, impacts on habitat used by the willow flycatcher would be greater than those anticipated from the Proposed Action. Because this species is not federally listed as threatened or endangered, no mitigation is required. Impacts on white-top aster, streaked horned lark, and myotis bats would be similar to those described under the Proposed Action. Therefore, no significant adverse impacts on the population or distribution of the special-status plant and wildlife species at McChord AFB are anticipated, and no mitigation is required.

4.7.3 Alternative 2: Removal of Individual Trees

Under Alternative 2, individual trees with the potential to exceed the maximum allowable height in any given area would be individually felled. Figure 4-1 shows the maximum allowable tree height within the proposed action area. Trees present in the Draper wetland would be topped, as described for the Proposed Action. Under Alternative 2, tree felling would be similar to that described for the Proposed Action. The maximum growth potential of Garry oak, ponderosa pine, and Douglas-fir exceeds the maximum allowable growth in all portions of the proposed action area.

4.7.3.1 Vegetation

Because all major tree species growing in the proposed action area have maximum growth potential that exceeds the maximum allowable tree height (Figure 4-1), all upland trees would be cut under Alternative 2. However, trees located in the Draper wetland would be topped (following current management practices within the Clear Zone) rather than felled in their entirety. Alternative 2 would result in similar impacts as the Proposed Action.

4.7.3.2 Wetlands

The Draper wetland and buffer within the kettle hole contain trees that have the potential to exceed the Clear Zone maximum allowable tree height. Under Alternative 2, within the

wetland kettle hole, trees would continue to be topped, rather than felled, in accordance with current practices. Topping trees would allow some tree canopy to remain in the Draper wetland. Consequently, impacts on the Draper wetland under Alternative 2 would not change from current conditions.

4.7.3.3 Wildlife

Impacts on wildlife with implementation of Alternative 2 would be similar to those from the Proposed Action. For wildlife living in the Draper wetland, including amphibian and reptile species, impacts would be less than those from Alternative 1, because trees would be topped rather than felled in their entirety and habitat would be maintained. Implementation of Alternative 2 would not result in a reduction in population size or distribution of a wildlife species.

4.7.3.4 Special-Status Plant and Wildlife Species

Impacts on special status species interest under implementation of Alternative 2 would be similar to those from the Proposed Action. White-top aster would not be affected by implementation of Alternative 2. Streaked horned lark habitat would not be adversely affected, and the action could increase available habitat for the species. Available habitat for long-legged myotis and long-eared myotis might be slightly reduced by implementing Alternative 2. Because trees in the Draper wetland would be topped rather than felled in their entirety, habitat for the willow flycatcher would be less affected by Alternative 2 than by Alternative 1. Impacts on white-top aster, streaked horned lark, and myotis bats would be similar to those described under the Proposed Action. Therefore, implementation of Alternative 2 would not result in a significant impact on special-status plant and wildlife species.

4.7.4 No Action Alternative

The selection of the No Action Alternative would not result in impacts on biological resources within the proposed action area.

4.8 Socioeconomics

4.8.1 Proposed Action

Economic impacts of a proposed action are caused by a change in the demand for goods and services in the local economy. Primary (or direct) impacts are caused by initial changes in expenditures, employment, salaries, and population directly related to the action. Secondary impacts are induced by the process of spending and re-spending, and the relationship between what is needed to produce goods and services and the commodities produced.

The Proposed Action is not expected to have an impact on demographics because no additional hires or personnel relocations from other Bases would be required. The existing labor force of the local area is expected to be able to provide workers to perform the proposed tree removal activities without additional persons relocating to the area. Because the Proposed Action does not require permanent hires or involve personnel relocations from other Bases, its implementation is not expected to have significant impacts on housing, schools, medical facilities, recreation, or shops and services.

Under the Proposed Action, logging of the trees would not have a significant impact on the total labor force, employment, or unemployment in the region because of the small number of temporary jobs that would be created. The economic impacts of the Proposed Action would be limited to temporary impacts associated with logging. Because the net increase in employment would be temporary and minimal, there would be no appreciable impact on the local economy. Expenditures for logging-related materials and supplies would have a small, short-term, beneficial impact on the economy of the region. Businesses near the proposed action area, such as gas stations and restaurants, could benefit from additional sales to loggers.

4.8.2 Alternative 1: Clear Cutting

Socioeconomic impacts from implementation of Alternative 1 would be similar to those under the Proposed Action.

4.8.3 Alternative 2: Removal of Individual Trees

Socioeconomic impacts from implementation of Alternative 2 would be similar to those under the Proposed Action.

4.8.4 No Action Alternative

Under the No Action Alternative, no clear-cutting or logging would occur; therefore, no impact on socioeconomics would result.

4.9 Cultural Resources

4.9.1 Proposed Action

As discussed in Section 3.9, none of the known or suspected homestead locations are within the proposed action area, and no other cultural resources are known or suspected in this area. Although a portion of Building 300 is within the proposed action area, there are no trees southwest of the building, so no activity would be conducted near this resource. Therefore, implementation of the Proposed Action would not result in impacts on cultural resources.

4.9.2 Alternative 1: Clear Cutting

Implementation of Alternative 1 would not result in impacts on cultural resources.

4.9.3 Alternative 2: Removal of Individual Trees

Implementation of Alternative 2 would not result in impacts on cultural resources.

4.9.4 No Action Alternative

Under the No Action Alternative, no logging would occur. Therefore, no impact on cultural resources would result.

4.10 Land Use

4.10.1 Proposed Action

The land use of the south approach-departure surface is classified as Open Space under the *McChord AFB General Plan* (Higginbotham Briggs and Associates, 2005). Under the Proposed Action, the land use classifications for the site would not change.

4.10.2 Alternative 1: Clear Cutting

Land use impacts from Alternative 1 would be the same as those with the Proposed Action.

4.10.3 Alternative 2: Removal of Individual Trees

Land use impacts from Alternative 2 would be the same as those with the Proposed Action.

4.10.4 No Action Alternative

Under the No Action Alternative, no impacts on land use would occur.

4.11 Utility Infrastructure

4.11.1 Proposed Action

The Proposed Action would not affect any utilities because the only utilities that exist in the proposed action area are two underground electrical lines which can be avoided during tree removal (McChord AFB, 2007).

4.11.2 Alternative 1: Clear Cutting

Alternative 1 would not have utility infrastructure impacts because the underground electrical lines can be avoided during tree removal.

4.11.3 Alternative 2: Removal of Individual Trees

Alternative 2 would not have utility infrastructure impacts because the underground electrical lines can be avoided during tree removal.

4.11.4 No Action Alternative

Under the No Action Alternative, no logging activities would occur; therefore, no impact on utilities would result.

4.12 Transportation

4.12.1 Proposed Action

The Proposed Action does not involve the modification of any transportation system at McChord AFB. Under the Proposed Action, workers who perform selective clear cutting

would temporarily increase traffic at McChord AFB. However, the increase is not expected to significantly burden the McChord AFB road system because only a few vehicles would be involved. After the work is completed, traffic levels at McChord AFB would revert back to existing levels. For these reasons, the Proposed Action is not expected to affect transportation.

4.12.2 Alternative 1: Clear Cutting

Transportation impacts under Alternative 1 would be substantially similar to those described for the Proposed Action.

4.12.3 Alternative 2: Removal of Individual Trees

Transportation impacts under Alternative 2 would be substantially similar to those described for the Proposed Action.

4.12.4 No Action Alternative

Under the No Action Alternative, no logging would occur; therefore, no change in Base traffic would result.

4.13 Airspace/Airfield Operations

4.13.1 Proposed Action

The Proposed Action would have a beneficial impact on airspace and airfield operations. According to the LIDAR survey, trees located throughout the on-base south approach-departure surface are currently violating or have the potential to violate the established airspace imaginary surfaces required for safe operation of aircraft, as described in Section 1.3. Failure to clear trees that violate the imaginary surface could result in the need to shut down McChord AFB CAT II ILS and significantly impair mission operations. Removal of selected trees in the proposed action area that violate the 50:1 imaginary surface would prevent mission impairment.

4.13.2 Alternative 1: Clear Cutting

Beneficial impacts on airfield operations from implementation of Alternative 1 would be the same as those with the Proposed Action.

4.13.3 Alternative 2: Removal of Individual Trees

Beneficial impacts to airfield operations from implementation of Alternative 2 would be the same as those with the Proposed Action.

4.13.4 No Action Alternative

Under the No Action Alternative, trees would not be logged. Violations of the 50:1 imaginary surface would continue, and airfield operations would be impaired, potentially resulting in the need to shut down McChord AFB CAT II ILS and significantly impairing mission operations.

4.14 Safety and Occupational Health

4.14.1 Proposed Action

The Proposed Action is needed because trees in the proposed action area penetrate the established airspace imaginary surfaces required for safe operation of aircraft. Implementation of the Proposed Action is expected to enhance safe aircraft operation and therefore would have a positive impact on safety and occupational health at McChord AFB.

Logging operations would be conducted using safe operating procedures, including use of protective clothing and equipment, proper equipment maintenance, and BMPs for safe cutting of limbs and trunks.

4.14.2 Alternative 1: Clear Cutting

Implementation of Alternative 1 would have similar positive impacts as the Proposed Action on safety and occupational health by removing trees that pose a potential hazard to aircraft and conducting safe logging operations.

4.14.3 Alternative 2: Removal of Individual Trees

Implementation of Alternative 2 would have similar positive impacts as the Proposed Action on safety and occupational health by removing trees that pose a potential hazard to aircraft and conducting safe logging operations.

4.14.4 No Action Alternative

Under the No Action Alternative, trees would remain in the proposed action area, in violation of established airspace imaginary surfaces required for safe operation of aircraft. Safety and occupational health would be compromised and would continue to degrade as trees grow taller.

4.15 Environmental Management

4.15.1 Proposed Action

4.15.1.1 Pollution Prevention

The proposed action area is mostly undeveloped (except for navigation aids and light standards) and requires custodial environmental management as well as management for natural environment plant and animal species. Under the Proposed Action, no change in current practices would be required. During logging operations, standard BMPs would be implemented to ensure that no release of fuels occurs. For these reasons, the Proposed Action would not significantly affect the pollution prevention program at McChord AFB.

4.15.1.2 Installation Restoration Program

No IRP sites are present within the proposed action area. For this reason, the Proposed Action is not expected to affect the IRP at McChord AFB.

4.15.2 Alternative 1: Clear Cutting

4.15.2.1 Pollution Prevention

Pollution prevention impacts under Alternative 1 would be the same as those described for the Proposed Action.

4.15.2.2 Installation Restoration Program

No IRP sites are present within the proposed action area. For this reason, the Proposed Action is not expected to affect the IRP at McChord AFB.

4.15.3 Alternative 2: Removal of Individual Trees

4.15.3.1 Pollution Prevention

Pollution prevention impacts under Alternative 2 would be the same as those described for the Proposed Action.

4.15.3.2 Installation Restoration Program

No IRP sites are present within the proposed action area. For this reason, the Proposed Action is not expected to affect the IRP at McChord AFB.

4.15.4 No Action Alternative

Under the No Action Alternative, there would be no impacts on pollution prevention practices or the IRP at McChord AFB.

4.16 Environmental Justice and Protection of Children

4.16.1 Proposed Action

The Proposed Action would not result in significant impacts associated with air quality, noise, groundwater, surface water, or hazardous materials and wastes. As a result, minorities, low-income residents, and children less than 17 years of age living in proximity to the proposed action area would not be disproportionately affected by the removal of trees in the proposed action area. The nearest residences to the proposed action area are approximately 1,800 feet to the east, separated from the site by a heavily forested area.

4.16.2 Alternative 1: Clear Cutting

Impacts on minorities, low-income residents, and children less than 17 years of age under Alternative 1 would be the same as those described for the Proposed Action.

4.16.3 Alternative 2: Removal of Individual Trees

Impacts on minorities, low-income residents, and children less than 17 years of age under Alternative 2 would be the same as those described for the Proposed Action.

4.16.4 No Action Alternative

Under the No Action Alternative, no tree removal would occur; therefore, no impact on environmental justice and protection of children would result.

4.17 Indirect and Cumulative Impacts

4.17.1 Indirect Impacts

Indirect impacts are defined by the CEQ in 40 CFR 1508.8 as those "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." Indirect impacts may include growth-inducing impacts and other impacts related to induced changes in the pattern of land use, population density or growth rate, and related impacts on air and water and other natural systems, including ecosystems.

Indirect impacts of the Proposed Action are addressed in the preceding resource-specific analyses. These impacts include a shift in species composition within the action area including the Draper wetland. These impacts are expected to be less than significant for the Proposed Action and Alternative 2. Under Alternative 1 potential increases in water table height of the Draper wetland could result in further indirect impacts with respect to future management such as a higher presence of waterfowl within the flight path. Habitat availability will decrease for some species and increase for others as a result of this action. The Proposed Action and alternatives would not result in any significant growth-inducing impacts, induced changes in population, or related impacts. Potential impacts on socioeconomics and health and safety would be slightly beneficial.

4.17.2 Cumulative Impacts

Cumulative impacts are defined by the CEQ in 40 CFR 1508.7 as "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

As discussed in the preceding resource-specific analyses, the potential direct and indirect environmental impacts associated with the Proposed Action and Alternatives 1 and 2 would be less than significant. Impacts associated with resources such as noise, air quality, and traffic during logging under the Proposed Action and Alternatives 1 and 2 would be short-term and temporary, so that no significant cumulative impacts are expected to result for these resources.

Potential impacts on biological resources under the Proposed Action and Alternatives 1 and 2 include some potential direct or indirect impacts on state sensitive, candidate, or monitor species, and on trees designated as significant by Pierce County. No federally listed threatened or endangered species would be affected, and, therefore, there are no regulatory requirements for mitigation. Other planned projects in the vicinity include obtaining Air Force waivers for surrounding areas where violations of the airspace imaginary surfaces have been identified. If these waivers are not obtained, it is possible that cumulative impacts from logging in the area could have significant impacts on biological resources. In this event, a separate evaluation of impacts on biological resources would be implemented

considering cumulative impacts from the current action along with any additional required actions.

The Proposed Action and alternatives would not directly or indirectly affect on-base or off-base land use. Logging in the proposed action area is not expected to indirectly cause more development near the site. Removal of trees violating airspace imaginary surfaces required for safe aircraft operation would have positive indirect and cumulative impacts on airfield operations and the ability of McChord AFB to carry out its mission.

Logging under the Proposed Action and alternatives would not involve any personnel relocations or additional hires. Logging would have some minor positive cumulative impacts on the local economy resulting from short-term, temporary increases in employment and expenditures during construction.

4.18 Unavoidable Adverse Impacts

There are no significant unavoidable adverse impacts associated with the Proposed Action or Alternatives 1 and 2. Implementation of the Proposed Action is expected to result in temporary and less than significant adverse impacts on air quality, noise, soil, biological resources, groundwater resources, and fuel usage. Minor air emissions, increased noise, use of fuel, and minor soil and consequent groundwater impacts are inherent in logging operations. Impacts on biological resources include elimination of some habitats in the proposed action area and a potential increase in invasive species. Potential impacts on migratory birds would be avoided with implementation of BMPs. There are no other federal laws or regulations that apply to these activities, and, as discussed in Section 4.7, the impacts would be less than significant. As discussed in the resource-specific impact sections, the impacts that the Proposed Action would have on these resources are less than significant because of the type of impacts and the proposed BMPs and other suitable controls that would be implemented.

4.19 Irreversible and Irretrievable Commitment of Resources

An irretrievable commitment is the loss of opportunities for producing or using a renewable resource for a period of time. Almost all activities produce varying degrees of irretrievable resource commitments. They parallel the effects for each resource discussed earlier in this chapter. They are not irreversible because changing management direction could reverse them. Loss of existing trees and associated habitat is an irretrievable commitment of resources associated with all alternatives.

Neither the Proposed Action nor the action alternatives would require any irreversible commitment of resources, because a change in management direction could allow trees to be re-established in the area. Other than the costs associated with tree removal, no Air Force-owned resources would be required to implement the Proposed Action. Long-term costs include periodic maintenance to remove new trees that would grow from seed or sprouting from cut stumps in the proposed action area.

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SECTION 5.0

List of Preparers

Name	Education	Experience	Role
Mark Bastasch	Master of Science	11 years	Noise Impacts Specialist
Jeff Benson	Bachelor of Science	19 years	Senior Technologist, Airfield Planning
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Marjorie Eisert	Bachelor of Science	18 years	Senior Technologist, Biological Resources
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Karin Lilienbecker	Master of Science	14 years	Senior Reviewer
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Laurel Redenbaugh	Bachelor of Science	7 years	Environmental Scientist
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SECTION 6.0

List of Agencies and Persons Consulted or Provided Copies

The following people were consulted during preparation of this EA:

- Adonis Clark – Pierce County Planning and Land Services Department
- Valerie Elliott - 62CES/CEV
- Mark Fetzer - HQ AMC/A7PI
- Joe Gibbens - 62 CES/CEV
- Mike Grenko - 62CES/CEV
- Lori Guggenmos - Washington Department of Fish and Wildlife
- Peter Heide - Washington Forest Protection Agency
- Cindy Hood - AFCEE
- Penny Keys - Washington Department of Ecology
- James McCormick - 62AW/JA
- Thomas Pytel - 62 CES/CEOEC
- Eileen Rodriguez - 62 OSS/OSAA
- Sandy Swope Moody - Washington Natural Heritage Program, WDNR
- Godofredo Velasco 62 CES/CECP
- Bill Velez - 62 CES/CECP
- James Nelson - AFCEE

The draft EA will be sent to the following agencies and organizations for public review:

Federal Agencies

- Ken Berg, Manager, Western Washington Office, North Pacific Coast Ecoregion, U.S. Fish and Wildlife Service, 510 Desmond Drive SE, Suite 102, Lacey, WA 98503

- Christine Reichgott, NEPA Review Unit, Office of Ecosystems, Tribal & Public Affairs, EPA, Region 10, 1200 Sixth Ave. , Seattle, WA 98101-3188

- Mr. Phil Crawford, Public Works; Attn: AFZH-PW Mail Stop: 17, Fort Lewis, WA 98433

State Agencies

- Dr. Allyson Brooks, State Historic Preservation Officer, Office of Archeology and Historic Preservation; P.O. Box 48343 Olympia, WA 98504-8343

- Barbara Ritchie, SEPA Unit Supervisor, Washington Department of Ecology; P.O. Box 47703, Olympia, WA 98504-7703

- Sue Patnude, Regional Director Washington Dept of Fish and Wildlife, Region 6; 48 Devonshire Road, Montesano, Washington 98563

- Stu Trefry, Puget Sound Regional Manager, Washington State Conservation Commission; P.O. Box 47721 Olympia, WA 98504-7721
- Doug Sutherland, Commissioner of Public Lands, Washington Department of Natural Resources; P.O. Box 47001 Olympia, WA 98504-7001

Local and Regional Agencies

- Pierce County Board of County Commissioners, City-County Building, 930 Tacoma Ave., South, Tacoma, WA 98402
- Chuck Kleeberg, Director Pierce County Planning and Land Services, 2401 S. 34th Street, Tacoma, WA 98409
- David Bugher , Assistant City Manager for Development, City of Lakewood, 6000 Main Street SW, Lakewood, WA 98499-5027
- Mr. Brian J. Ziegler, Director, Pierce County Public Works & Utilities, 2702 S. 42nd Street, Ste. 201, Tacoma, WA 98409-7322
- Mr. Don Wickstrom, Director, City of Lakewood Public Works Department, 6000 Main Street SW Lakewood, WA 98499-5027

Tribal Contacts

- Chairperson, Nisqually Indian Tribe, 4820 She-Nah-Num Drive, SE, Olympia, WA 98503
- Chairperson, Puyallup Indian Tribe, 2002 East 28th Street, Tacoma, WA 98404-4996

Libraries

- Pierce County Library , Lakewood Branch, 6300 Wildaire Road SW Lakewood, WA 98499
- Pierce County Library Parkland-Spanaway Branch 13718 Pacific Avenue South, Tacoma, WA 98444
- Tillicum Branch Library 14916 Washington Ave. SW Lakewood, WA 98498
- Base Library, 851 Lincoln Blvd. (Bldg 851) McChord AFB, WA 98438

Agency and public review comments will be included in Appendix B in the final EA.

SECTION 7.0

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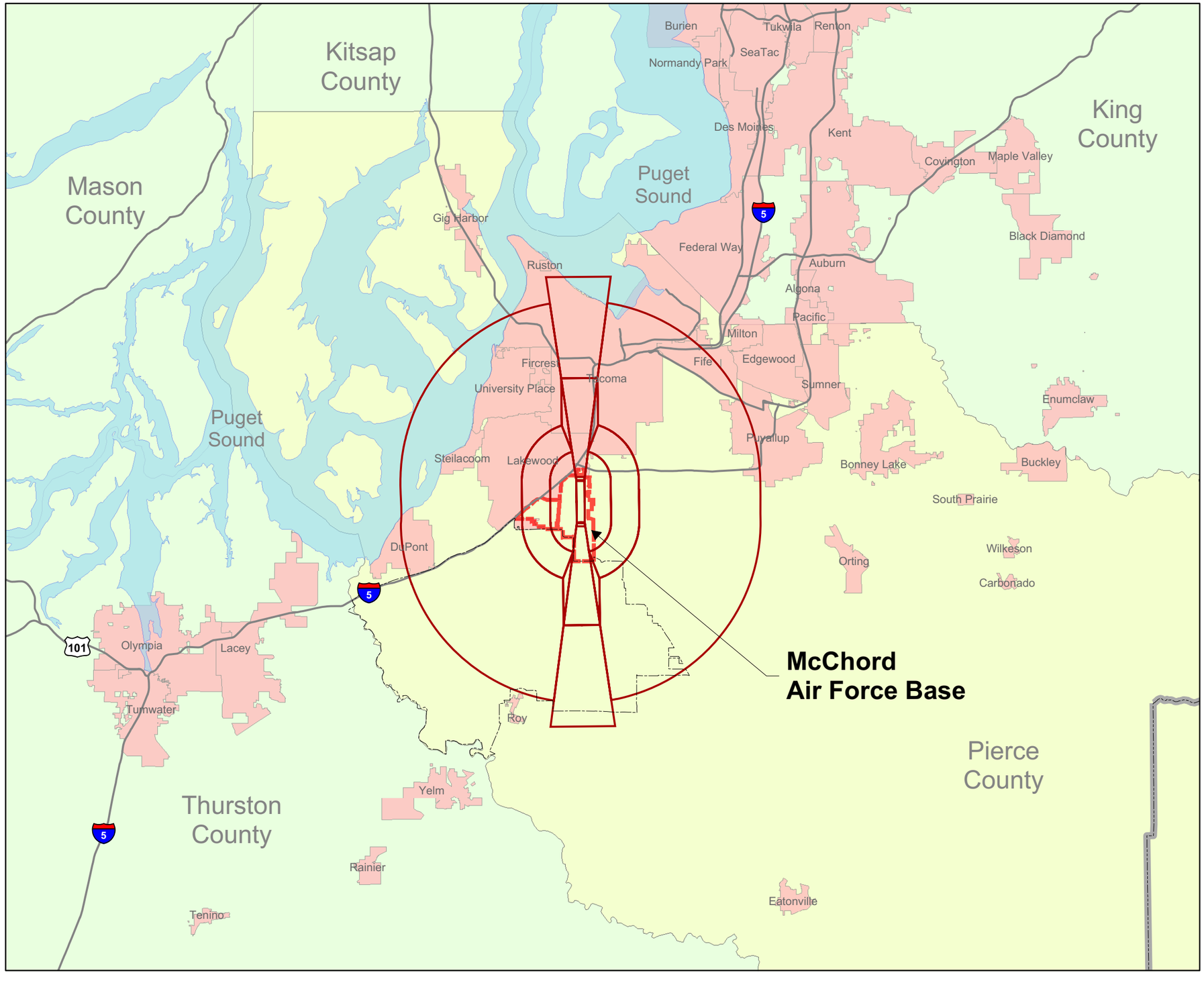
Figures



- UFC Airspace Imaginary Surfaces
- City Boundary
- County Boundary
- Coast
- McChord AFB Base
- Highways
- Fort Lewis
- Mt. Rainier National Park

N

0 2.5 5 10

Miles

Figure 1-1

LOCATION MAP

TREE AND VEGETATION MANAGEMENT
ENVIRONMENTAL ASSESSMENT
McCHORD AIR FORCE BASE, WASHINGTON

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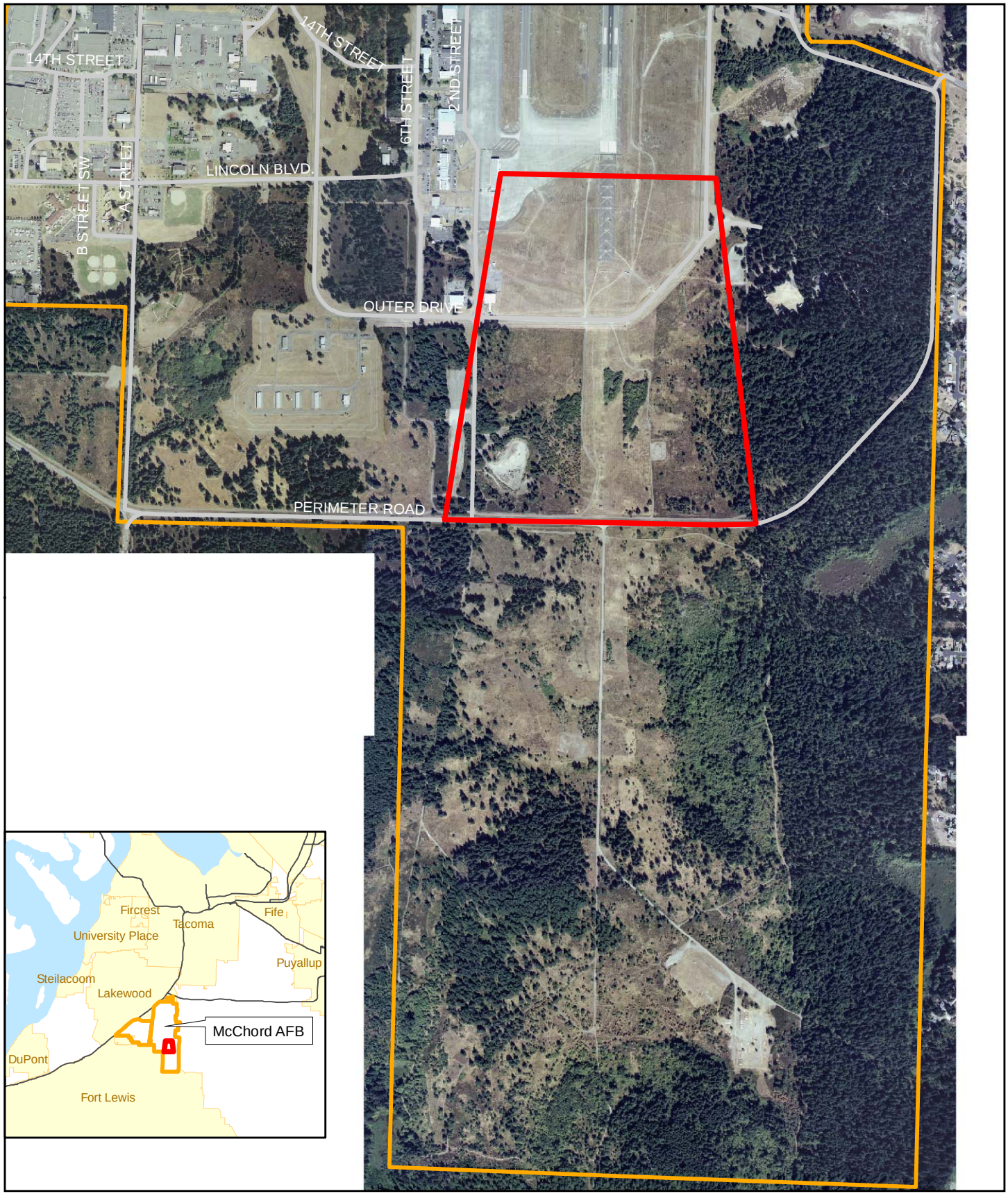

Legend

South Approach Boundary

Installation Boundary

0 250 500 1,000 1,500 Feet

N

Figure 1-2
PROPOSED ACTION BOUNDARY
TREE AND VEGETATION MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT
MCCHORD AIR FORCE BASE, WASHINGTON

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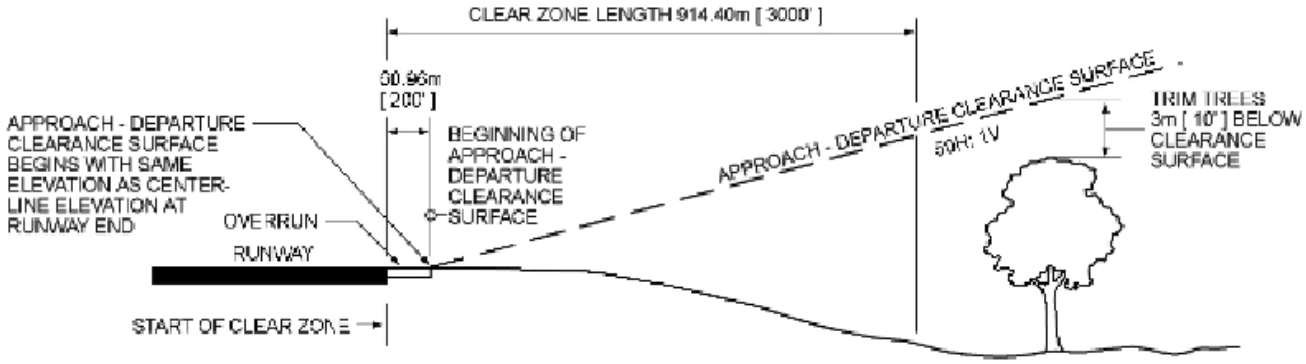


FIGURE 1-3

TYPICAL SECTION OF AIRSPACE IMAGINARY SURFACE

TREE AND VEGETATION MANAGEMENT
ENVIRONMENTAL ASSESSMENT
McCHORD AIR FORCE BASE, WASHINGTON

334265.01.04.91_ES022007001SEA Fig1-3_Typical_Section_v1.ai 4/19/07_rd

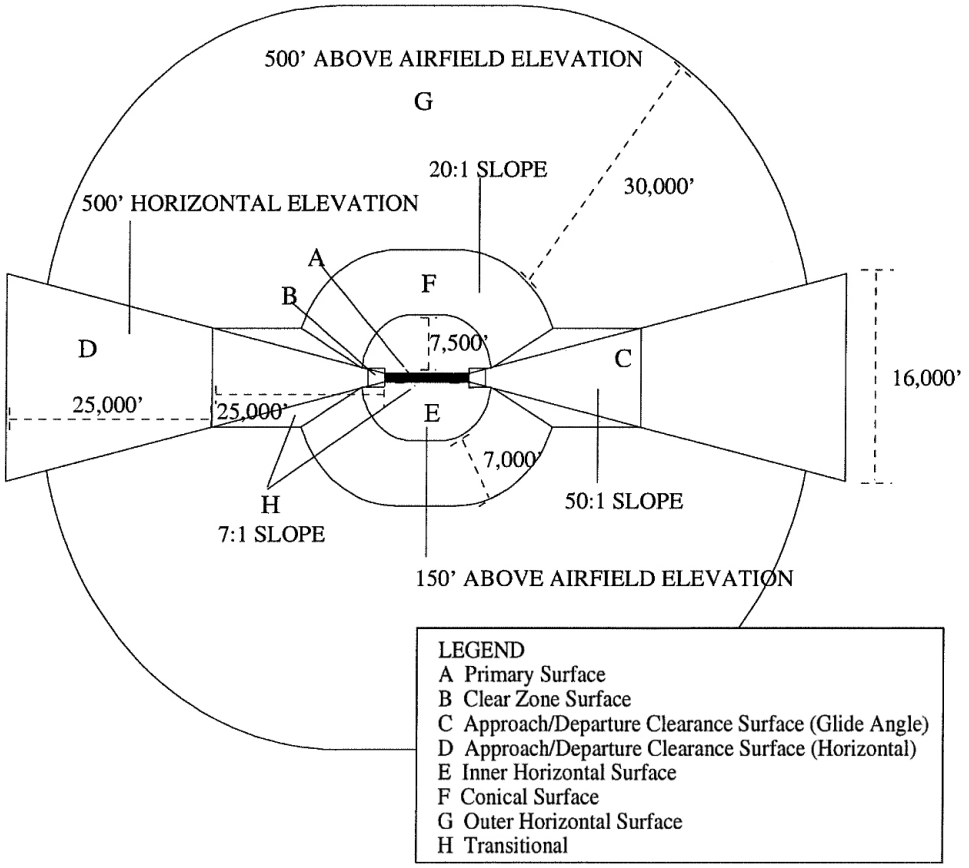


FIGURE 1-4
AIRSPACE CONTROL SURFACE PLAN
TREE AND VEGETATION MANAGEMENT
ENVIRONMENTAL ASSESSMENT
McCHORD AIR FORCE BASE, WASHINGTON

SOURCE: Air Force Handbook 32-7084 (1 March 1999),
AICUZ Program Manager's Guide

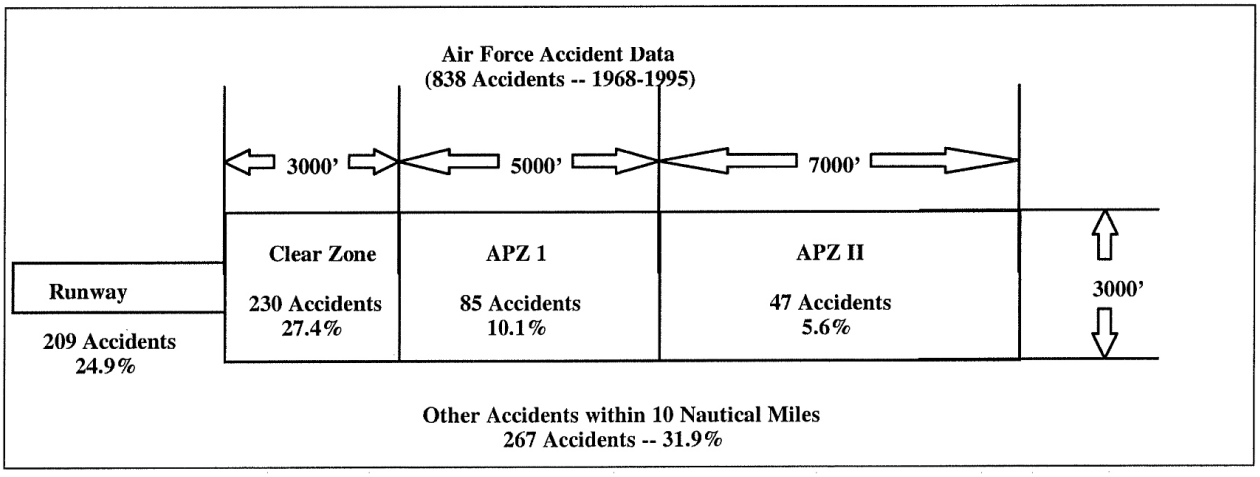
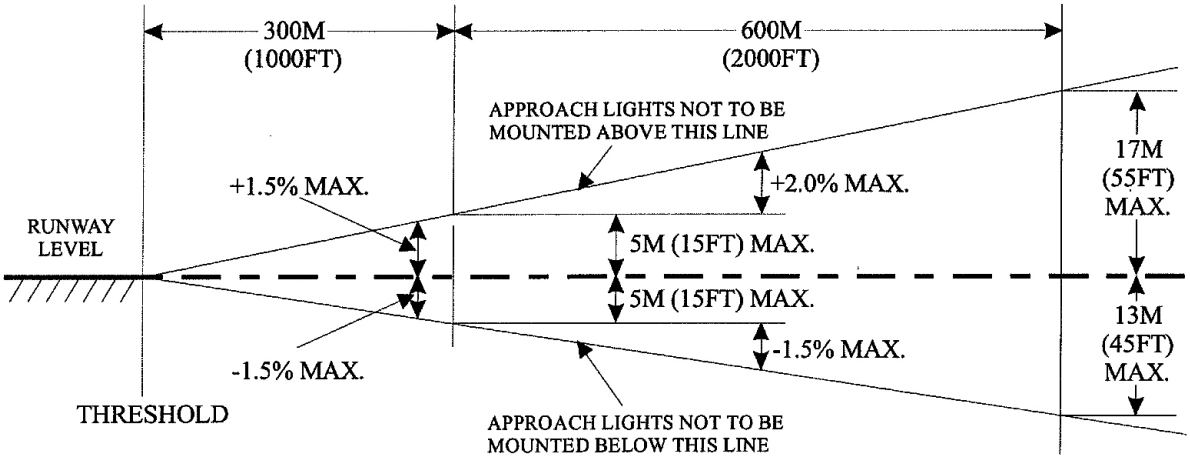


FIGURE 1-5
AIR FORCE ACCIDENT DATA
TREE AND VEGETATION MANAGEMENT
ENVIRONMENTAL ASSESSMENT
McCHORD AIR FORCE BASE, WASHINGTON

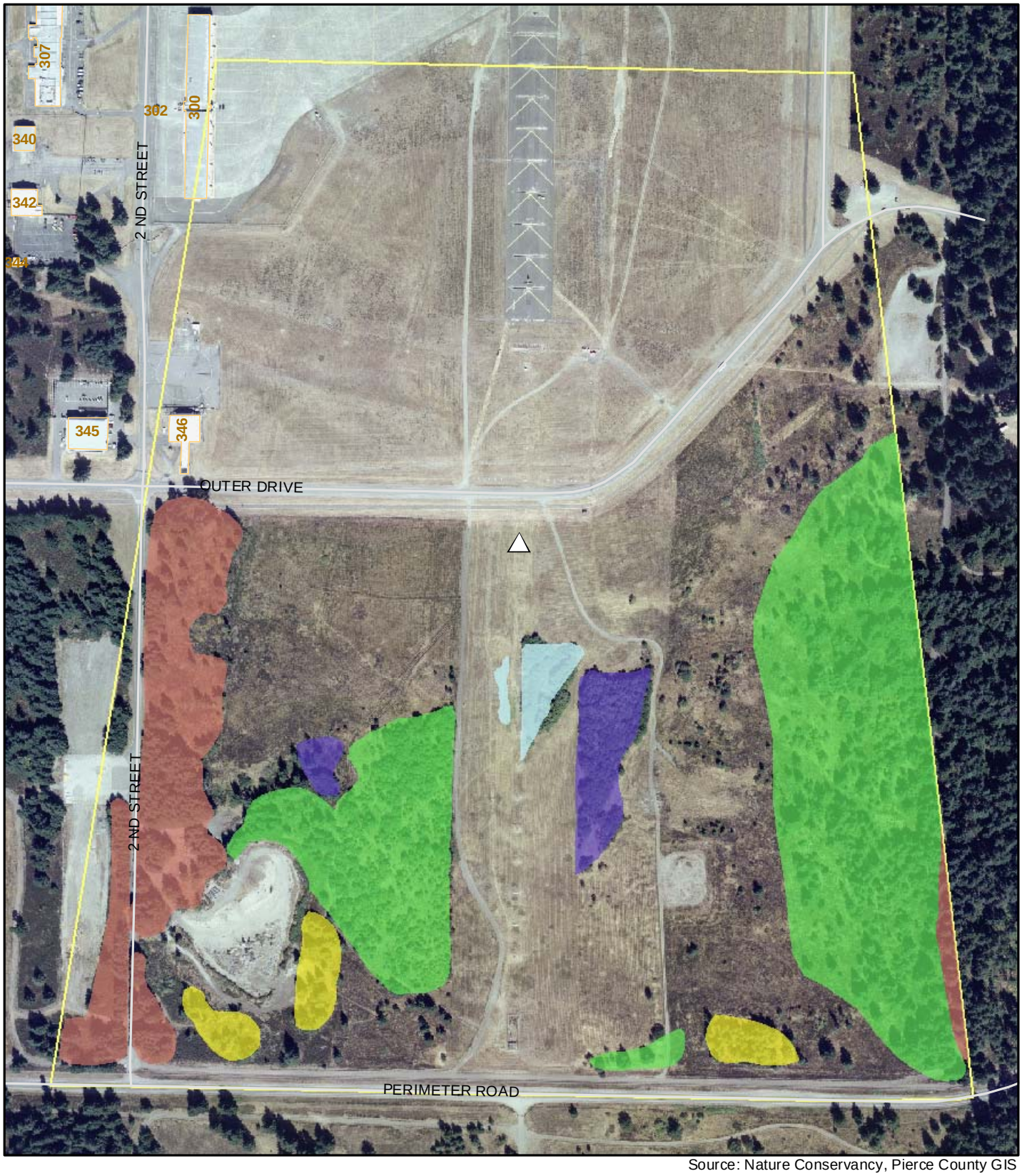
SOURCE: Air Force Handbook 32-7084 (1 March 1999),
AICUZ Program Manager's Guide



NOTE: THE BOUNDARIES OF THE LIGHT PLANES ARE THE RUNWAY THRESHOLD, 60M (200FT) AHEAD OF THE END LIGHT STATION, AND 60M (200FT) EACH SIDE OF CENTERLINE.

FIGURE 1-6
LIGHT PLANE ELEVATION LIMITS
TREE AND VEGETATION MANAGEMENT
ENVIRONMENTAL ASSESSMENT
McCHORD AIR FORCE BASE, WASHINGTON

SOURCE: Unified Facilities Criteria 3-535-01,
Visual Air Navigation Facilities (17 November 2005)



Source: Nature Conservancy, Pierce County GIS

△ White top aster
Draper Wetland
Douglas-fir/Garry oak
Garry oak/sedge-hook violet
Garry oak/serviceberry-sword fern
Other/Not Specified (assumed Garry oak)

301 Building
Project Area Boundary

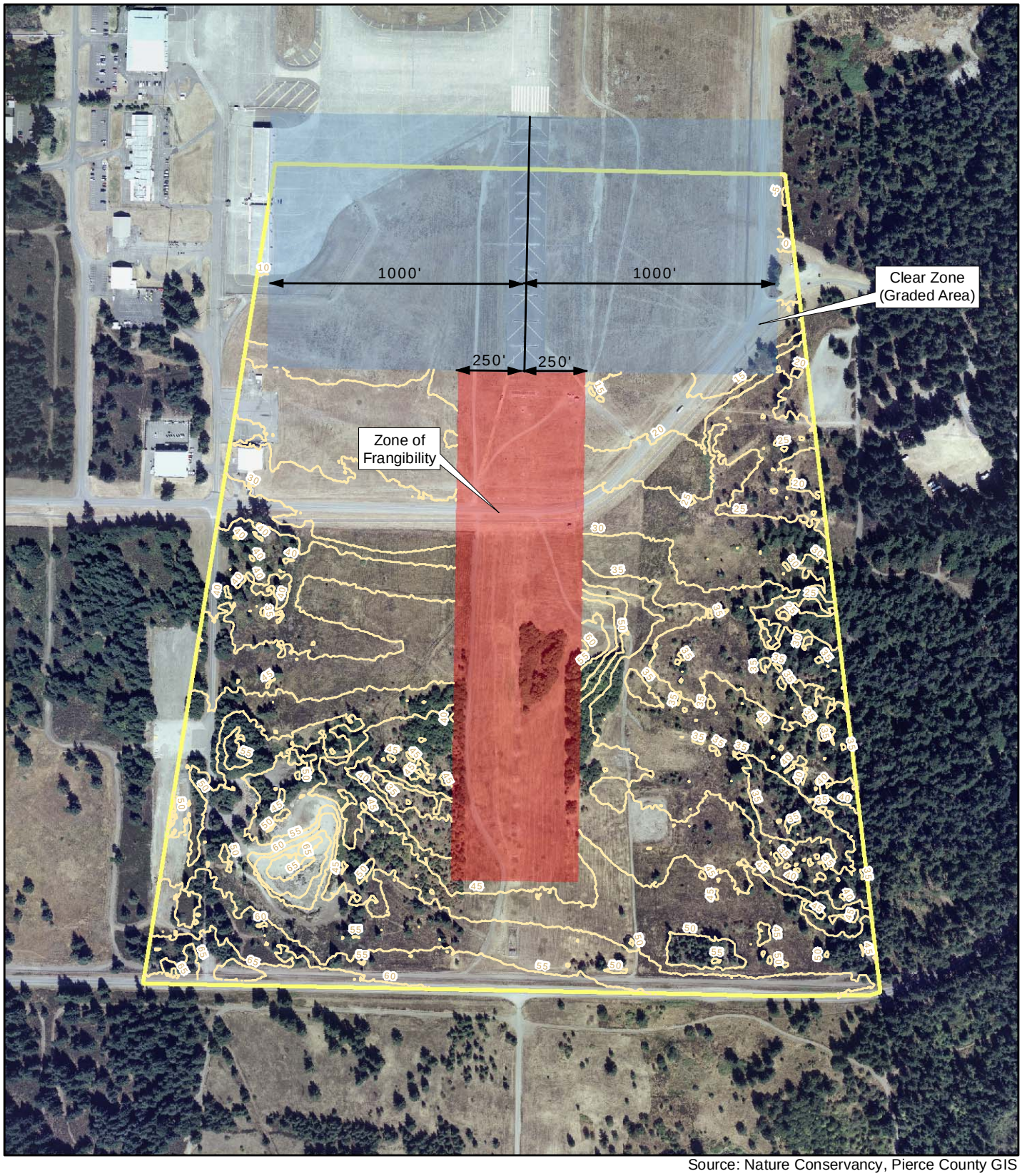
Note: Wetland and tree coverage obtained from McChord AFB based on TNC survey in 1996. Slight modifications made by CH2M HILL to better reflect current vegetation cover.

N

0 100 200 400 Feet

Figure 3-1
VEGETATION COMMUNITIES IN PROPOSED ACTION AREA
TREE AND VEGETATION MANAGEMENT ENVIRONMENTAL ASSESSMENT
MCCHORD AFB, WASHINGTON

\\baloo\groups\NWRMIS\GIS\McChord\GIS\MXD\Tree_wetlands April 2007



Source: Nature Conservancy, Pierce County GIS

Max Height Contour

Tree Restriction Zone

Zone of Frangibility - No Trees

Clear Zone (Graded Area) - No Trees

Proposed Action Area Boundary

Note: Maximum allowable tree height contours based on difference between 50:1 imaginary surface (less 10 feet) and ground surface topography per UFC 3-260-1. Trees are not permitted within the Clear Zone (Graded Area) or the Zone of Frangibility.

N

0 210 420 Feet

Figure 4-1

MAXIMUM ALLOWABLE TREE HEIGHTS

TREE AND VEGETATION MANAGEMENT ENVIRONMENTAL ASSESSMENT MCCHORD AFB, WASHINGTON

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Appendix A
Air Force Form 813

tree vegetation.jpg (1140x1590x24b jpeg)

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR MOBILITY COMMAND

MEMORANDUM FOR ALL AMC MSGs/CE

16 AUG 2003

FROM: HQ AMC/CEP
507 Symington Drive
Scott AFB IL 62225-5022

SUBJECT: Tree and Vegetation Management within the Airfield Imaginary Surfaces, Clear Zones, and Approach Light Planes (SUSPENSE: 7 Nov 03)

1. The AMC policy for trees and vegetation within the airfield imaginary surfaces, clear zones, and approach light planes is to be in compliance with both the Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*, and AFI 32-1076, *Visual Air Navigation Facilities.* Recent Air Traffic Systems Evaluation Program (ATSEP) visits have identified additional attention is required in tree and vegetation management within the airfield area.

2. With the need for an effective vegetation and tree management program, we request the following actions be taken:

a. Survey the airfield imaginary surfaces and approach light planes for compliance and document the areas where tree and vegetation penetrations occur.

b. Determine the extent of the violations and whether they are on base property or on land where easements are in place that permit tree and vegetation removal actions.

d. If the trees and vegetation are located on off-property not controlled by the base, initiate actions to acquire the appropriate real estate instruments to permit removal.

e. Where violations occur, develop a project(s) for removal of all trees and vegetation to bring the airfield into compliance. Report the project(s) in ACES using the title, "Tree Violations, Base Name" for us to track projects and the command requirement.

3. Please report back to us your base's findings by 7 Nov 03. If corrective actions are required, provide us with the plan, including projects and estimated costs, to bring the airfield into compliance. If the members of your staff have any questions, please have them contact Mr. Mike Flahive, HQ AMC/CEPR, 229-0768, or by e-mail: mike.flahive@amc.af.mil.

LARRY W. BRITTENHAM, Colonel, USAF
Director, Planning and Programming Division
Directorate of Civil Engineering

cc:
HQ AMC/CEO/CEV/DOA/SEF/SEG

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol
RCS:

INSTRUCTIONS: *Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).*

SECTION I - PROPONENT INFORMATION

1. TO *(Environmental Planning Function)*	2. FROM *(Proponent organization and functional address symbol)*	2a. TELEPHONE NO.
62 CES/CEV	62 CES/CECP	DSN 382-3268

3. TITLE OF PROPOSED ACTION

Airfield Tree & Vegetation Management (Phase 1A) for Runway 16/34 South Approach Surface (50:1) north of Perimeter Road.

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*

The purpose is to bring Runway 16/34 South Approach Surface, north of Perimeter Road, into compliance with Unified Facilities Criteria 3-260-01, Airfield and Heliport Planning and Design, and UFC 3-535-01, Visual Air Navigation Facilities (see pg 2)

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*

The proposed action is to remove existing and potential violations north of Perimeter Road in the South Runway Approach Surface (50:1), IAW the base Tree & Vegetation Management Plan. The preferred, action alternative is to clear-cut all (see pg 2)

6. PROPONENT APPROVAL *(Name and Grade)*	6a. SIGNATURE	6b. DATE
W. M. Velez GS-12		20061201

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects Including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U= unknown effect)*	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*	☒	☐	☐	☐
8. AIR QUALITY *(Emissions, attainment status, state implementation plan, etc.)*	☐	☐	☐	☒
9. WATER RESOURCES *(Quality, quantity, source, etc.)*	☐	☒	☐	☐
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)*	☒	☐	☐	☐
11. HAZARDOUS MATERIALS/WASTE *(Use/storage/generation, solid waste, etc.)*	☐	☒	☐	☐
12. BIOLOGICAL RESOURCES *(Wetlands/floodplains, threatened or endangered species, etc.)*	☐	☐	☐	☒
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*	☐	☐	☐	☒
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*	☐	☒	☐	☐
15. SOCIOECONOMIC *(Employment/population projections, school and local fiscal impacts, etc.)*	☐	☒	☐	☐
16. OTHER *(Potential impacts not addressed above.)*	☐	☒	☐	☐

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. ☐ PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____ ; OR
☒ PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.

18. REMARKS

The proposed action would affect a defined land area (trapezoid). A ground survey of the area, to flag the imaginary surface, is part of this EIAP project. EIAP will also determine whether surveys of archaeological, wetlands or biological resources are needed to characterize the Affected Environment. If necessary, additional work will be undertaken to address Section II, 12-13, Biological and Cultural Resources - Unknown Effects. The EIAP will require an Air Conformity calculation. Although a waiver package will be submitted for all other phases of the Tree & Vegetation Management Plan, the cumulative effects analysis in this EIAP should assess whether full implementation of the plan would impact the area affected by the Phase IA component of the Plan.

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION *(Name and Grade)*	19a. SIGNATURE	19b. DATE
Michael J. Grenko GM 13		20061201

Block 4 continued: (AFI 32-1076) IAW AMC/A7P (CEP) policy memo (16 Aug 03) to all AMC MSGs/CE by implementation of Phase 1A of the base Tree & Vegetation Management Plan. The need for this action is to eliminate existing and potential tree violations penetrating the approach imaginary surface (50:1; see UFC 3-260-01, Table 3.7, Item #7) north of Perimeter Road. Without this action, violations will increase the runway instrument approach-departure minimum and compromise Category II Instrument Landing System (ILS) capability. Operation of the CAT II ILS for precision instrument approach is essential to the combat airlift mission of McChord AFB. This Environmental Impact Analysis Process (EIAP) involves a decision between the following methods to comply with the UFC criteria: implementation of the Management Plan through either clear-cut, selective removal techniques, or topping. A decision is needed in FY07. An airfield waiver request will be submitted by 62 AW/CC to HQ AMC/CV for approval IAW UFC 3-260-01 for all imaginary surfaces other than the specified Phase 1A (50:1) surface.

Background: Tree violations were identified by 62 CES/CECP in a contracted Light Detection and Ranging (LIDAR) survey of flightline tree height. LIDAR technology uses an airborne scanning laser to produce a composite digital model from data on the height and position of objects penetrating imaginary surfaces (e.g., 50:1). LIDAR results are displayed as a composite of elevation points; individual trees are not identified. In 1998 and 2003, limited tree removal in the South Runway approach was performed IAW AFI 32-1076. The McChord Airfield Tree and Vegetation Management Plan submitted to HQ AMC/A7P by memo dated 24 Dec 03, stated analysis of LIDAR data led to development of four, phased projects for execution to achieve compliance with UFC criteria. The proposed action analyzed by this EIAP (PQWY 04-0051) is solely the prioritized, Phase IA removal of tree violations within the South Runway approach zone primary surface north of Perimeter Road. The prioritization of Phase IA is supported by the most recent Air Traffic System Evaluation Report (17 - 21 Jul 06 ATSEP) for McChord AFB. In a repeat observation of the 2004 ATSEP, the report reiterates the need to complete EIAP and take other steps to implement the following recommendation: "Remove offending trees to bring the airfield into compliance with UFC 2-260-01 criteria." The report acknowledges the prioritized approach to violations, specifically stating, "If 50 to 1 tree violations are not trimmed or removed, instrument approach and departure minimum will be increased effectively eliminating CAT II ILS capability in the near future."

Block 5 continued: trees and vegetation currently penetrating or having the potential to violate the 50:1 approach surface (which includes the FAA 34:1 surface). The proponent (62 CES/CECP) prefers this alternative to expedite implementation and achieve compliance. The proposed action analyzed by this EIAP does not include Phase 1 (North Runway or the South Runway portion south of Perimeter Road), or Phases 2, 3, and 4 of the Plan described in Block 4. Each class of violation not otherwise addressed by the proposed action (Phase 1A - South) will be the subject of an airfield waiver request for each remaining phase of the four-phased Plan. Each four phases is designed to comply with specific UFC criteria: Phase 1 applies to all on-base violations in the North & South Runway Approach Surface (50:1); Phase 2 removes on-base violations within the East & West Transitional Surfaces (7:1); Phase 3 removes on-base violations within the East Inner Horizontal Surface; Phase 4 will require real estate action(s) to remove off-base violations. The airfield waiver process is a separate HQ AMC/CV decision to approve/disapprove a temporary waiver of actions otherwise described in the four-phased Plan. A temporary waiver is not a component of the proposed action analyzed in this EIAP. Similarly, the four-phased Plan is not considered a set of "connected actions" as defined by 40 CFR 1508.25(a), that would otherwise require a single EIAP to analyze the environmental effects of all phases simultaneously. Irrespective of the temporary airfield waiver process, the phases are not interdependent, and execution need not be simultaneous. Disposition of valuable timber resulting from the proposed action is outside the scope of this EIAP. Also, tree-topping must be eliminated from a detailed analysis in this EIAP, because the bulk of violations are firs that would die if topped and become a ground hazard. The EIAP, IAW 32 CFR §989.8(a), must analyze reasonable alternatives to the proposed action and the "no action" alternative, as fully as the proposed action alternative. Reasonable selection standards support the following alternatives:

No Action Alternative: This alternative will be analyzed with reference to a comprehensive airfield waiver request that would be required to support it; even though, the ATSEP acknowledges a prioritized response to violations in the South approach zone.

Alternative 1: This alternative is similar to the preferred alternative, except the South approach surface (50:1) north of Perimeter Road would be surveyed selectively. Only areas of vegetation containing trees in violation of UFC criteria would be clear-cut. In contrast, areas of vegetation identified (by LIDAR) as penetrating the 50:1 approach slope would be surveyed to determine, based on topography and vegetative type, whether any potential exists for the trees to penetrate the approach surface. If no potential is identified, vegetation in the area would not be removed, e.g., the Draper wetland or a stand of Garry Oaks.

Alternative 2: This alternative would require a comprehensive, detailed survey of the South Runway Approach Surface north of Perimeter Road to identify individual trees in violation of the 50:1 slope criteria by height and location. This survey would also identify specific trees with the potential to penetrate the 50:1 approach surface. The LIDAR survey would be used to identify the general area in which individual violations are located. No clear-cutting would occur; only individual trees would be cut and removed. Extensive field work would be required to identify individual trees violating or potentially violating UFC criteria.

Appendix B
Public Notice and Agency Correspondence

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October 12, 2007

MEMORANDUM FOR DISTRIBUTION

On Behalf of: 62d Airlift Wing, McChord AFB, WA, and Headquarters Air Mobility Command, Scott AFB, IL

Subject: Draft Environmental Assessment of Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Surface, McChord AFB WA

The United States Air Force Headquarters Air Mobility Command and 62d Airlift Wing have prepared the subject Draft Environmental Assessment (EA). The attached draft EA analyzes removal of vegetation violating the Unified Facilities Criteria (UFC) within the subject area north of Perimeter Road on McChord AFB. The analysis contained in the draft EA supports a Finding of No Significant Impact (FONSI) for the proposed action.

The purpose of the Proposed Action is to comply with Air Force policy for tree and vegetation management and maintain a safe airspace for operating aircraft. This document describes the Proposed Action, reasonable alternatives, and the No Action alternative.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation in and solicit comments on the attached draft EA and FONSI. Copies of these documents also are available for review by the public until November 13, 2007, as described on the attached Notice of Availability published in the Tacoma News Tribune. The documents are also available online at <*http://public.mcchord.amc.af.mil/*>. Please provide your comments by mail to 62 AW/PA (Public Affairs), 100 Col Joe Jackson Blvd, Suite 1077, McChord AFB, WA 98438-1109, within 30 days from the date of this letter.

A list of federal, state, and local agencies (IICEP List) contacted regarding this draft EA is provided as an attachment to this letter. If you feel any additional agencies should review and comment on this proposal or analysis, please effect a re-distribution of this letter.

Sincerely,

CH2M HILL

Julie Peterson for

Karin Lilienbecker

RDD/072840005 (NLH3603.doc)

Attachments:

1. Draft EA/FONSI
2. Notice of Availability
3. IICEP List

Environmental Assessment of Installation Development at McChord Air Force Base, Washington

Interagency and Intergovernmental Coordination for Environmental Planning List

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Western Washington Office
North Pacific Coast Ecoregion
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USEPA, Region 10
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Regional and Local Agencies

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Tribal Contacts

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Olympia, WA 98503

Chairperson
Puyallup Indian Tribe
2002 East 28th Street
Tacoma, WA 98404-4996

Libraries

Pierce County Library
Lakewood Branch
6300 Wildaire Road SW
Lakewood, WA 98499

Tillicum Branch Library
14916 Washington Ave SW
Lakewood, WA 98498

Pierce County Library Parkland-Spanaway Branch
13718 Pacific Avenue South
Tacoma, WA 98444

Base Library
851 Lincoln Blvd, Building 851,
McChord AFB, WA 98438

Notice of Availability
Draft Environmental Assessment of Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Surface and Finding of No Significant Impact for McChord AFB, Washington

The United States Air Force Headquarters Air Mobility Command and 62d Airlift Wing have prepared an Environmental Assessment (EA) of Tree Removal at McChord Air Force Base (AFB), Washington. The analysis contained in the EA considered potential environmental consequences of the Proposed Action on 15 resource areas: air quality; noise; wastes, hazardous materials and stored fuels; topography and soils; water resources; biological resources; socioeconomics; cultural resources; land use; utility infrastructure; transportation; airspace/airfield operations; safety and occupational health; environmental management; and environmental justice. The EA shows that the proposed tree removal would not significantly impact the environment and supports a Finding of No Significant Impact (FONSI). Consequently, an Environmental Impact Statement should not be necessary to implement the Proposed Action.

Copies of the draft EA and FONSI are available for review until November 13, 2007 at the Pierce County Library Lakewood Branch, 6300 Wildaire Road SW, Lakewood, WA; the Tillicum Branch Library, 14916 Washington Ave SW, Lakewood, WA; the Pierce County Library Parkland-Spanaway Branch, 13718 Pacific Avenue South, Tacoma, WA; the Base Library, 851 Lincoln Blvd, Bldg 851, McChord AFB, WA; and online at <*http://public.mcchord.amc.af.mil/*>. Please address written comments on the Draft EA and FONSI to 62 AW/PA, 100 Col Joe Jackson Blvd, Suite 1077, McChord AFB, WA 98438-1109.

Appendix C
Air Emission Calculations

TABLE C-1

Emissions Estimates for General Conformity Evaluation

Airfield Tree and Vegetation Management in the Runway 16/34 South Approach-Departure Imaginary Surface (50:1), McChord Air Force Base, Washington

				Emissions Factors (gram/hr)*						Emissions (Pounds)					
SCC	Equipment	Days of operation[1]	Hr/day	VOC	PM10	PM2.5	CO	Nox	SO2	VOC	PM10	PM2.5	CO	Nox	SO2
2260007005	Chain Saws > 6 HP	160	5	322.37	46.47	42.75	1683.30	4.56	0.67	568.57	81.96	75.40	2968.83	8.04	1.19
									(TON)	0.28	0.04	0.04	1.48	0.00	0.00

* Emissions factors from EPA Non-Road

			Emissions Factors (gram/hr)*					Emissions (Pounds)				
Equipment	Days of operation[1]	Hr/day	VOC	PM10	PM2.5	CO	Nox	VOC	PM10	PM2.5	CO	Nox
Self-loading Truck idling	160	2	4.09	0.80	0.74	33.21	43.58	2.88	0.57	0.52	23.43	30.74
							(TON)	0.00	0.00	0.00	0.01	0.02

* Emissions factors from Mobile 6 run at 2.5 miles per hour. Resulting gram/hr emissions factors multiplied by 2.5 to give gram/hour emission rate

			Emissions Factors (gram/Mile)					Emissions (Pounds)				
Equipment	Days of operation[1]	Mile/day	VOC	PM10	PM2.5	CO	Nox	VOC	PM10	PM2.5	CO	Nox
Self-loading Truck travel to and from site**	160	40	0.53	0.32	0.30	2.66	9.26	7.53	4.53	4.19	37.59	130.67
							(TON)	0.00	0.00	0.00	0.02	0.07

* Emissions factors from Mobile 6 run at 30 miles per hour.

** Worker assumed to travel to site in truck

Total Proposed Action Emissions						
	VOC	**PM10**	**PM2.5**	**CO**	**Nox**	**SO2**
TOTAL (LBS)	578.99	87.05	80.11	3029.85	169.45	1.19
TOTAL (TON)	0.29	0.04	0.04	1.51	0.08	0.00

1- Operational parameters from James Nelson (USDA Forest Service Forester to the Air Force)